United States Circuit Court of Appeals,

FOR THE NINTH CIRCUIT.

BUTTE AND SUPERIOR MINING COMPANY,
Defendant-Appellant,

vs.

MINERALS SEPARATION, LIMITED, ET AL.,
Plaintiffs-Appellees.

BRIEF FOR DEFENDANT-APPELLANT.

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INDEX.

II.

III.

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This is an appeal from the decision of the District Court sustaining Letters Patent No. 835,120 for Process of Ore Concentration, issued to Sulman, Picard & Ballot, on November 6, 1906, and finding the same to be infringed by the defendant, not only when it has used less than 1% of oil on the ore, but also when it has used more than 1% of oil on the ore.

Prior to January, 1917, the defendant used "oils" (among others oleic acid) in quantities below one-half of 1% on the ore. Since that date it has not used oleic acid at all, but has used other "oils" in quantities always above one-half of 1% on the ore, and for most of the time in quantities above 1% on the ore. (See Defendant.s Exhibit No. 158, Tr., Vol. IX., p. 5184.)

The court below found that prior to January, 1917, defendant infringed all the claims in issue (to wit, claims 1, 2, 3, 5, 6, 7, 9, 10, 11, 12), and that since that date it has in-

fringed all said claims excepting claims 5, 6 and 7, which specifically relate to the use of oleic acid.

The facts presented require this Court to decide not only whether the use of more than 1% of oil infringes the patent in suit, but also whether the use of more than one-half of 1% and less than 1% of oil infringes. Thus, referring to Defendant's Exhibit No. 158 (Tr., Vol. IX., p. 5184), it will be seen that defendant used during the period from January 17 to 29, 1917, 0.84% of oil, and during the period from January 30 to February 3, 1917, 0.80% of oil. So also Defendant's Exhibit No. 161 (Tr., Vol. IX., p. 5192), shows that between February 1 and 9 the amounts of oil used daily were between 0.64% and 0.79%. Subsequently more than 1% of oil on the ore was used by defendant, as shown by said exhibits and Exhibit No. 162 (Tr., Vol. IX., p. 5194). The question whether the use of either of these quantities of oil constituted an infringement of plaintiffs' patent is, therefore, directly presented.

We admit that, under the authoritative and final interpretation of the patent by the Supreme Court, the use of oil in quantities of less than one-half of 1% (as shown by Defendant's Exhibit No. 158, Tr., Vol. IX., p. 5184) infringed; but we contend that, under said interpretation, the use of oil in quantities above one-half of 1% does not infringe.

The patent in suit is the same patent which was before the courts in the Hyde case (*Minerals Separation vs. Hyde*). In that case the learned Judge of the District of Montana (207 Fed., 956) *did not regard the use of a fraction of 1% of oil as of the essence of the patented process.* He therefore sustained not only the claims in issue which were in terms limited to the use of a fraction of 1% of oil (to wit, claims 1, 2, 3, 5, 6, 7, 12), but he also sustained the claims which were in terms broad enough to cover the use of any "small quantity" of oil (to wit, claims 9, 10, 11).

When the Hyde case came before this Court on appeal, an entirely different view of the invention was taken (214 Fed., 100). This Court found that the *essence of the invention consists in the use of a small fraction of 1% of oil.* In its opinion it said (p. 102):

> "That which is presented as *new* in the patent, and as the *pivotal discovery on which its validity depends,* is

the formation of a froth or scum containing the metalliferous matter produced by agitation of the pulverized ore in water, by the action of oil *in a quantity less than one per cent. of the quantity of ore treated.*"

Again (p. 104) :

> " When the claims and the description of the process of the appellees' patent are compared with the patents of the prior art, it will be seen that the *only material difference is in the smaller quantity of oil which the appellees use.*"

This court also held, as a matter of law, that the reduction in the amount of oil used to a fraction of 1% did not involve patentable subject-matter. It, therefore, remanded the case with directions to dismiss the bill.

Next, the patent in suit came before the learned Judge of the District of Delaware in the Miami case (*Minerals Separation vs. Miami*, 237 Fed., 609). In that case the court found, just as this court had before found, that the *essence of the invention consists in the use of a small fraction of 1% of oil.* In its opinion it said (p. 630) :

> " The patentability of the process of the first patent in suit *resides in the use of oil in the extremely minute proportion disclosed in the descriptive portion of the patent* to effect separation of froth with its metallic particles from the remainder of the mixture by flotation. The amount there disclosed is *not in excess of 'a fraction of one per cent. on the ore' and may be only one-tenth of one per cent. on the ore, or even less.*"

The learned District Judge in the Miami case, however, held, as a matter of law, that the use of a small fraction of 1% of oil constituted patentable subject-matter. He therefore sustained those claims in issue there which are in terms limited to a fraction of 1% of oil (to wit, claims 1 and 12), while he *held invalid the claim in issue there which is in terms broad enough to cover the use of any " small quantity " of oil (to wit, claim 9).**

Subsequently, the Hyde case came before the Supreme Court by *certiorari* (242 U. S., 261). The Supreme Court

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* Claims 10 and 11 were not put in issue in the Miami case.

agreed with this court, and with the District Judge in the Miami case, in finding that the *use of a fraction of 1% of oil is of the essence of the invention.* It said (p. 265):

> " The process of the patent in suit, as described and practiced, *consists* in the use of an amount of oil which is '*critical*,' *and minute* as compared with the amount used in the prior processes, '*amounting to a fraction of one per cent. on the ore.*' "

Again (p. 271):

> " While the evidence in the case makes it clear that they discovered the final step which converted experiment into solution, 'turned failure into success' (The Barbed-Wire patent, 143 U. S., 275), yet the investigations preceding were so informing that this final step was not a long one, and the *patent must be confined to the results obtained by the use of oil within the proportions often described in the testimony and in the claims of the patent as 'critical proportions' 'amounting to a fraction of one per cent. on the ore.'* "

While the Supreme Court held, as a matter of law, that the use of a small fraction of 1% of oil constituted patentable subject-matter, it specifically condemned the view taken by the District Judge in the Hyde case that the use of a small fraction of 1% is not of the essence of the invention. It said (p. 271):

> " While we thus find in favor of the validity of the patent, *we cannot agree with the District Court in regarding it valid as to all of the claims in suit.*"

It, therefore, declared invalid those claims which in terms are broad enough to cover the use of any " small quantity " of oil (to wit: claims 9, 10 and 11) and sustained only those claims which are in terms limited to the use of a " fraction of one per cent. of oil."

Subsequently, the Miami case came before the Circuit Court of Appeals for the Third Circuit (244 Fed., 752). Since the questions of validity and scope of the patent in suit at that time had been authoritatively determined by the Supreme Court, the only questions considered were (1) the scope of the patent as

etermined by the Supreme Court, and (2) infringement. As o infringement, the decision of the court was not unanimous; ut as to the fact that the Supreme Court had strictly limited he patent to the use of a fraction of 1% of oil, it was entirely nanimous. Discussing the contention of plaintiff in that ase, that (p. 758): "Whenever the modifying agent of the atent (oil) is used, a person infringes who gets air in the ulp in any fashion and agitates the mixture by any means to sufficient extent to cause the mineral particles to attach hemselves to air bubbles, and to rise therewith above the top f the mixture in a collection of bubbles and metal particles, o wit, froth," the court said (p. 758):

> "The contention of the plaintiff, at least, omits the *very definite limitation* of the patent to the results obtained by the use of oil *within the described proportions.*"

Again it said, referring to the Supreme Court's decision p. 759):

> "The District Court had held valid certain claims in which the proportion of oil was described simply as 'a small quantity', and the Supreme Court, in reversing that finding and holding those claims invalid, used the quoted words of limitation in confining the patent to the results obtained by the use of oil in the *critical proportions of less than 1%.*"

Further on in its opinion it said (p. 760):

> "The affinity of oil for metal was known, and, though old, was employed in the invention; but that this affinity in a given condition is greatest when its quantity is relatively least, or that the affinity increases with the decrease of oil below a given quantity (*less than 1%*), is the *soul of the discovery and was wholly new.*"

We, therefore, see that, in succession, this court in the Hyde case, the District Court of Delaware in the Miami case, the Supreme Court in the Hyde case and the Court of Appeals of the Third Circuit in the Miami case, all agreed in

holding—and in so holding they all disagreed with the District Court of Montana—that the *use of a fraction of 1% of oil is of the essence of the patented process; and that the use of larger quantities of oil are not, and cannot be covered by the claims of the patent in suit.*

As we read the decision below in this case (Tr., Vol. I., p. clxxvii), it seems to us that the learned District Judge has overlooked these facts. It seems to us that he has overlooked the fact that the Supreme Court did not agree with him in finding that the patentees are entitled to cover the use of any "small quantity" of oil; but, on the contrary, that the Supreme Court agreed with this Court in finding that *the use of a small fraction of 1% of oil is of the essence of the patented process.* The opinion of the District Court in this case, holding that the use by defendant of 1% and more of oil infringes, seem to us to be a reaffirmance in all respects of its decision in the Hyde case, *including the errors in it which have been condemned by the Supreme Court.*

The Questions to Be Decided.

Since the Supreme Court has in the Hyde case authoritatively determined the rights of the plaintiffs under the patent in suit, this court at this time has only three questions to decide:

The first question is: What has the Supreme Court decided in the Hyde case as to the metes and bounds of the invention at bar, and does the use of oil in proportions greater than the so-called "critical proportions" trespass upon any just rights of the plaintiffs, as those rights have been defined by the Supreme Court?

The second question is: Is the new evidence presented in this case—evidence not before the Supreme Court in the Hyde case—of such character as, in the opinion of this court, would have led the Supreme Court to reach a different conclusion if it had been presented in the Hyde case?

The third question is: What is the purpose and effect of the so-called "disclaimer" filed by the plaintiffs after the opinion of the Supreme Court in the Hyde case was handed down?

I.

The Metes and Bounds of the Patent in Suit as Defined by the Supreme Court in the Hyde Case.

The first question—to-wit: What has the Supreme Court decided in the Hyde case as to the metes and bounds of the invention at bar, and does the use of oil in proportions greater than the so-called "critical proportions" trespass upon any just rights of the complainant, as those rights have been defined by the Supreme Court?—requires this court only to study and apply the decision of the Supreme Court. Whether we or our adversaries think it right or wrong, that decision is the law of the land with respect to the patent in suit, on the facts presented in the Hyde case. No court, except the Supreme Court itself, can change it.

This court will not listen to the defendant if it argues that the Supreme Court was wrong in finding invention in the patent in suit on the record before it; *and for the same reason, this court will not listen to the plaintiffs when they argue, as they do argue in this case, that the Supreme Court was wrong in limiting, as it certainly did limit, the scope of the patent in suit to the use of a small fraction of 1% of oil on the ore.*

Defendant does not at this time, and in this place, quarrel with the decision of the Supreme Court in the Hyde case. *It is the plaintiffs who quarrel with that decision.*

In its decision the Supreme Court said:

> "The process of the patent in suit, as described and practiced, consists in the use of an amount of oil which is '*critical*,' and *minute* as compared with the amount used in prior processes, '*amounting to a fraction of one per cent. on the ore*' (p. 265).
>
> * * * * * *
>
> "The experimenters were working on the Cattermole 'Metal Sinking Process' as a basis when it was discovered that the granulation on which the process depended practically ceased when the oleic acid (oil) was reduced to about five-tenths of one per cent. 'on the ore.' It was observed, however, that, as the amount of oleic acid was further reduced and the granulation

diminished, there was an increase in the amount of ' float froth,' which collected on the surface of the mass and that the production of this froth reached its maximum when about one-tenth of one per cent. or slightly less ' on the ore ' of oleic acid was used (p. 267).

* * * * * *

" While we thus find in favor of the validity of the patent, we *cannot agree with the District Court in regarding it valid as to all of the claims in suit.* As we have pointed out in this opinion, there were many investigators at work in this field to which the process in suit relates when the patentees came into it, and it was while engaged in study of prior kindred processes that their discovery was made. While the evidence in this case makes it clear that they discovered the final step which converted experiment into solution, ' turned failure into success,' yet the investigations preceding were so informing that this *final step was not a long one, and the patent must be confined to the results obtained by the use of oil within the proportions often described in the testimony and in the claims of the patent as ' critical proportions,' ' amounting to a fraction of one per cent. on the ore,'* and therefore the decree of this court will be that the patent is valid as to claims No. 1, 2, 3, 5, 6, 7, and 12, and that the defendant infringed these claims, but that it is *invalid as to claims* 9, 10 *and* 11 " (p. 271).

Comparing the group of claims which was sustained—to-wit, claims 1, 2, 3, 5, 6, 7, and 12—with the group of claims which was condemned—to-wit, claims 9, 10 and 11—we find that all the claims of both groups were limited in terms to the production of a " froth " by " agitation," and to the separation of the " froth " from the material; but that the claims which were sustained were limited in terms to the use of oil in proportions of *less than 1% of the ore,* while the claims which were condemned were broad enough to cover the use of a " *small quantity* " of oil. The only difference between the claims which were sustained and those which were condemned is, therefore, that the former were, while the latter were not, in terms limited to the use of less than 1% of oil on the ore. Nothing can be plainer, therefore, than that the Supreme Court has decided that the plaintiffs are entitled to a monopoly of the use of oil in the *critical proportions described in the specifications and in the*

proofs in the Hyde case, but that they are *not entitled to a monopoly of the use of any larger quantities of oil.*

The only question which can arise in construing the decision of the Supreme Court is whether the use of oil in proportions between one-half of one per cent. (0.5%) and one per cent. (1%) falls within the monopoly of the patent. The Supreme Court says, in the passage above quoted, that the " patent must be confined to the results obtained by the use of oil within the proportions *often described in the testimony* and *in the claims* as ' critical proportions ' ' amounting to a fraction of one per cent. on the ore.' " The questions which arise are: What " fraction of one per cent." is here referred to? What " fraction of one per cent." is " often described in the testimony " in the Hyde case as the critical proportions? What " fraction of one per cent." is referred to in the claims as the critical proportions? To answer these questions this court must go to the patent specifications, and to the testimony which was before the Supreme Court to which it referred. It must first ascertain, therefore, what are the " critical proportions " set forth in the patent in suit.

The Critical Proportions Described in the Patent are One-Half of 1% or Less.

In the introductory clause the patent refers to the Cattermole process, in which it says " an amount of oil varying from four per cent. to six per cent. of the *weight of the metalliferous matter present* " is employed. Simple arithmetic teaches us that 4% of the weight of the metalliferous matter in any ore which assays 25% metalliferous matter would be 1% on the ore (and an assay value of 20% is exceptional), so that 4% on the weight of the metalliferous matter in all ores assaying less than 25% would be " a fraction of one per cent." on the ore.*

The specification continues (p. 1, line 28) :

> " We have found that if the proportion of oily substance be *considerably reduced*—say to a fraction of one per cent. on the ore—," etc.

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* Plaintiff's expert in the Hyde case, Dr. Chandler, admitted that the Cattermole oil proportions applied to the tailings at the Broken Hill mine where the process was practiced, called for the use of only 1.2% to 1.8% on the ore (Tr., Vol. III., p. 882).

The specifications say, in the example given beginning at page 1, line 70, that (p. 1, line 79):

> "To this is added a very small proportion of oleic acid (say from *0.02 per cent. to 0.5 per cent. on the weight of ore*)."

Again they say, page 1, line 96:

> "The minimum amount of oleic acid which can be used to effect the flotation of the mineral in the form of froth may be *under 0.1 per cent.* of the ore; but this proportion has been found suitable and economical."

We, therefore, see that the "critical proportions" referred to by the Supreme Court are defined in the examples contained in the specifications as being between *one-half of one per cent.* (0.5%) *and one-fiftieth of one per cent.* (0.02%), the preferred amount specified being *one-tenth of one per cent.* (0.1%).

THE CRITICAL PROPORTIONS "OFTEN DESCRIBED IN THE TESTIMONY" IN THE HYDE CASE ARE LESS THAN ONE-HALF OF ONE PER CENT.

Turning now to the record in the Hyde case, we find that the testimony referred to by the Supreme Court as defining the "critical proportions," to which the patent has been by it limited, is as follows:

In "Complainant's Exhibit Higgins' Report of March 16, 1905" (Tr., Vol, III., p. 1109) the following appears:

"Details of Experiments."

Acid.	*Oleic Acid.*	*% of Oleic*	*Time*	*Temp.*	*Remarks*
1.1%	15 cc.	3 % on ore	4 min.	30.5° C.	Very little float.
"	7½ cc.	1.5 % " "	4¼ "	31 "	Rather more float.
"	5.2 cc.	1.04 % " "	6 "	31 "	Still more float.
"	3.1 cc.	0.62 % " "	6 "	32 "	
"	1.6 cc.	*0.32* % " "	7 "	31 "	*Float vastly increased.*
"	0.5 cc.	*0.10* % " "	8 "	31 "	*Float vastly increased.*
"	0.5 cc.	0.1 % " "	4¾ "	29 "	Not finished.
"	0.4 cc.	0.8 % " "	6½ "	30.5 "	
"	0.5 cc.	0.1 % " "	8 "	31 "	
"	0.5 cc.	0.1 % " "	8 "	31 "	Weight of concs. 170 gms.
"	0.2 cc.	0.04 % " "	8 "	32 "	Apparently not much different.
"	0.1 cc.	0.002% " "	12 "	32 "	Little worse.
"	none	none	7 "	32 "	Very little float.
"	none	none	10 "	32 "	More froth.

Plaintiff's witness Dr. Chandler said in answer to x-Q. 42 (Tr., Vol. II., p. 182):

> "The inventors simply state, referring to the Cattermole patent which has just been previously discussed, that four to six per cent. of the weight of metalliferous matter present is employed, that they have found that if the proportion of oily substance be considerably reduced, say to a fraction of one per cent. on the ore, granulation ceases to take place. What this fraction of one per cent. is, they do not mention. *The only way in which I can interpret this fraction of one per cent. is by referring to other portions of the specification, where this fraction of one per cent. is expressed in figures;* for example, at line 81 of page 1 of the specification is the following statement, speaking of the ore:
>
> "'To this is added a very small proportion of oleic acid (say from *0.02 per cent. to 0.5 per cent.* on the weight of the ore).'
>
> "That is, from *1/50 of one per cent. up to one-half of one per cent.*"

Again, in answer to x-Q. 46 (Tr., Vol. II., p. 185), he said:

> "These *extremes represent from .4 of a pound per ton of ore to 10 pounds per ton of ore.** The patentees do not state on what particular condition of the ore

* 0.4 lbs. per ton is 0.02% and 10 lbs. per ton is 0.5%.

> this variation of quantity depends, whether it depends upon the percentage of zinc in the ore or some other quality, but they do indicate that the selection of quantity *between these extremes* must rest with the person familiar with the art who practices the process and it is fair to assume that such person would decide how much oleic acid to use by the results of the simple preliminary tests suggested by the patentees."

An additional quotation from Dr. Chandler's testimony in the Hyde case, which should be read here, will be found in this brief *infra*, page 40.

Plaintiffs' witness Ballantyne testified as follows (Tr., Vol. II., p. 370) :

> " I have seen the agitation-froth process carried out many hundreds of times. I have also seen investigations of the process making wide variations step by step in the factors which I have referred to above, and I have myself, on many occasions, carried out these investigations and I now know that if the instructions which Messrs. Sulman, Picard and Ballot drew up in February, 1905, are carried out, namely, to use a slimy pulp, acidified with say .5 per cent. of sulphuric acid, to heat the pulp say to 30° Centigrade and then to agitate it violently with proportions of oil beginning at fifty pounds of oil per ton of ore* and repeating this test, reducing the quantity of oil step by step down to the *vanishing point*, it is inevitable that the agitation-froth shall be produced when the *quantity of oil is diminished to the limits set forth in the patent in suit*, and that a particularly good froth and efficient concentration is obtained when the proportion of oil is about *0.1 per cent. on the ore*, the percentage recommended in the patent in suit as being suitable and economical."

In answer to x-Q. 102 he said (Tr., Vol. II., p. 449) :

> " In my opinion the operation of the agitation-froth process *is defined in the clearest possible terms in the patent in suit*, and this remark applies particularly to the *quantity of oil* to be used."

Further along in the same answer he said :

> " I have never seen the agitation-froth process successfully carried out by the use of an amount of oil equal to practically one per cent. by weight on the ore,

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* 50 lbs. per ton is 2.5%.

and *in my opinion 0.9999 per cent. of oil would not be a proper quantity* (that is to say, it would not be a suitable and economical quantity),as contemplated by the patent, and would not therefore be a *suitable fraction of one per cent.* as contemplated by the patent " (Tr., Vol. II., p. 450).

Ballot, one of the patentees of the patent in suit, answering Q. 45 (Tr., Vol. IV., p. 1728), said :

> " The only way to carry out the process is that of applying the *proportions of oil set forth in the patent*, but to determine, as all practical men will do, which of the proportions, *within the range*, yield the best result, the characteristic nature of the froth is always an indicator which will of itself tell an experienced operator when the best conditions have been attained, * * * "

Sulman, one of the patentees of the patent in suit, examined as a witness for defendant, in answer to Q. 33 (Tr., Vol. IV., p. 1614), said :

> " When we decreased the amount of oil to about *.6 per cent. upon the ore, granulation had ceased to appear* and a very considerable proportion of mineral was found to float to the surface as a thick froth. We still further decreased the amount of oil until we found that with *.2 to .1 per cent.* of oil on the ore *practically the whole of the mineral came to the surface as a thick blackish matted froth.*"

Again the same witness testified (Tr., Vol. IV., p. 1654) :

> " Q. 120. Then, it might be, that an operator following what you have termed the synthetic mode of regulation might not know whether he was adding oil or acid within the proportions set forth in the patent in suit ?
>
> " A. It might be so, for the space of a minute or two ; as to the acidity, this can be determined instantly by means of Litmus paper, or other suitable indicator, it only being necessary to have a slight degree of acidity present in the pulp. As to oil, the proportions specified in the patent do not need extremely fine adjustment. When the generally minute quantities of oil to ore are considered, which *amount in practice, roughly, to about two pounds per ton of ore** in a great num-

* 2 lbs. per ton is 0.1%

ber of cases, or perhaps somewhat less or more, conditions of ore supply may fluctuate to some extenwithout greatly affecting the result. If these fluctuat tions in supply are excessive, then the operator would naturally make such further *slight adjustment* of his oil addition as would meet the altered circumstances."

Picard, one of the patentees of the patent in suit, examined as a witness by the defendant, testified as follows (Tr., Vol. IV., p. 1684) :

"Q. 9. In the patent in suit, No. 835,120, in an example of the application of the process the amount of oleic acid used in that instance is specified as from *.02 to .5 per cent.* on the weight of ore, the latter quantity being twenty-five times the former. How would an operator practicing the process determine between these wide limits what quantity of oil to use?

"A. As a matter of fact, *both quantities mentioned are so minute* in relation to the proportion of ore that it is *hardly right to describe the limits as very wide*, but the operator would have no difficulty in determining, if there was any marked difference, which was the best quantity to use, by simply noting whether he was obtaining the specific frothing phenomenon which the patent indicates as being that required."

Further he testified as follows (Tr., Vol. IV., p. 1706) :

"Q. 81. At the time the process which the patent in suit purports to set forth was first exhibited to you, I take it that you were not then for the first time made cognizant of the possibility of using *so small a quantity* of oil as had been used, or that you then first became cognizant of the utility of beating air into the pulp; am I right in this?

"A. I had no idea prior to this, that by reducing the quantity of oil to the *limits which were used in this experiment* that such a result would be obtained. I, of course, knew that air would float mineral, previously oiled, but it was not anticipated by me hitherto that this particular result would be obtained if air were beaten in, in the manner in which it was done in making this test. The result of the operation as a whole was an entire revelation to me, and though I knew that work was being carried out on the reduction of the quantity of oil, I never for one moment anticipated in my mind, as being likely to occur, what in fact actually did occur."

Ballot, one of the patentees of the patent in suit, examined as a witness by defendant, testified as follows (Tr., Vol. IV., p. 1724) :

> " Q. 34. And when you saw the work in progress from March 1, 1905, onwards, as referred to by you in your answer to question 29, was this the first occasion upon which you had been informed as to the use in an oil flotation process of the intentional beating in of air for the purpose of promoting flotation ?
>
> " A. The intentional beating in of air to produce or promote the flotation of froth which was developed by that process was certainly not known until the fact had been actually discovered that by using a *very small quantity of oil, say .2 or .1 per cent.*, and agitating it for a certain time, and then leaving the mixture to stand that the whole froth rose to the surface. * * *"

In answering Q. 42 (Tr., Vol. IV., p. 1726), Ballot stated :

> " Q. 42. The patent in suit gives a range of quantity for the oleic acid to be used extending from .02 to .5 per cent. in the example set forth in the paragraph beginning at line 70, page 1, the larger quantity being twenty-five times the magnitude of the smaller. In carrying out this process how is the determination to be made as to which of these widely differing quantities is to be used ?
>
> " A. Starting with the small quantity, say at the rate of *one pound per ton of ore*,* an operator can soon tell by the appearance as to whether the characteristic froth is produced or not. Guided by appearances he would either increase or decrease the quantity of oil or oleic acid until the cauliflower or characteristic froth was produced, which in itself will be an unfailing index as to whether or not proper conditions have been attained, and he need only then repeat the measurements quantitatively of oil or oleic acid added to his pulp * * *."

Higgins, one of plaintiffs' engineers, examined as a witness by defendant, stated, as his testimony was put in narrative form in the Supreme Court transcript, in answer to

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* 1 lb. per ton is 0.05 per cent.

a question as to what was the " first occasion upon which you ever saw a part of the constituents of the ore, which, in the form of pulp had been oiled, floating upon the surface of the pulp " that :

> " In all the slide machine tests that I have conducted I have *never had to use quantities of oily reagents outside of those mentioned in the patent in suit.* The greatest amount of oil that I have ever used in practice is *four pounds per ton of ore*, and the smallest amount I have ever used in practice is *one pound of oil per ton of ore.*" *

Plaintiffs' witness, Dr. Liebmann, testified as follows (Tr., Vol. III., pp. 709, 710) :

> " They inform the world what they consider the limits of their proportions, and they add that in their experience *0.1 per cent.* of oil of the amount of ore has been found ' suitable and economical.' Surely one cannot demand more, and even a metallurgist of very low qualifications cannot fail to determine with the greatest ease what quantities will give him the desired results."

The foregoing is the testimony to which the Supreme Court refers in its opinion, where it says " the patent must be confined to the results obtained by the use of oil within the proportions *often described in the testimony * * * as ' critical proportions.'* "

What were the " critical proportions " " often described in the testimony " to which the Supreme Court has in terms limited the patent in suit ? The answer is : They were less than one-half of one per cent. (0.5%) of oil on the ore. It is to these proportions that the Supreme Court has limited the patent in suit. In other words, the " fraction of one per cent." of the claims is *that fraction of one per cent. which is half of one per cent.* (0.5%) *or less.* Any quantity of oil greater than one-half of one per cent. (0.5%) on the ore is not within the scope of the patent as construed by the Supreme Court.

This construction of the patent was not only justified by the testimony in the case, but it was directly invited by plaintiffs' counsel in argumen·t

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* 4 lbs. per ton is 0.2% and 1 lb. per ton is 0.05%.

PLAINTIFFS' COUNSEL TOLD THE SUPREME COURT THAT THE CRITICAL PROPORTIONS WERE LESS THAN ONE-HALF OF ONE PER CENT. AND THAT THE USE OF MORE THAN ONE-HALF OF ONE PER CENT. OF OIL WOULD NOT INFRINGE THE PATENT.

Plaintiffs' counsel, Mr. Kenyon, in reply to questions put by Mr. Justice McREYNOLDS and Mr. Justice PITNEY, said (printed report of argument before Supreme Court, p. 85; Deft.'s Ex. 229, Vol. IX., p. 5306):

"MR. JUSTICE MCREYNOLDS: I would like to ask you when in this process of reducing oil your invention came into existence?

"MR. KENYON: At *about one-half of one per cent.* of oil.

"MR. JUSTICE MCREYNOLDS: Before you got to the one-half of one per cent. did you have any invention?

"MR. KENYON: We were passing from the region of Cattermole, which was a distinct—

"MR. JUSTICE MCREYNOLDS: *I want to know when your invention came into existence?*

"MR. KENYON: This invention was *not reached,* I should say, from those figures, until *about .5, that is, one-half of one per cent., of oil was reached.*

"MR. JUSTICE MCREYNOLDS: At one per cent. you had no invention?

"MR. KENYON: *No.*

"MR. JUSTICE MCREYNOLDS: At one-half of one per cent. you did have invention?

"MR. KENYON: *It began to come. Remote, but it began to come. At .3 of one per cent. the float vastly increased. At .1 of one per cent. the float again vastly increased.*

"MR. JUSTICE MCREYNOLDS: WHEN THIS FLOAT HAS MORE THAN ONE-HALF OF ONE PER CENT. OF OIL IT DOES NOT INFRINGE?

"MR. KENYON: IT DOES NOT INFRINGE.

"MR. JUSTICE PITNEY: What have you to say in answer to what Mr. Scott said the other day to the effect that 1.8 per cent., or perhaps more, of oil, would give the same result with increased agitation.

"MR. WILLIAMS: *Absolutely no.*

"MR. KENYON: *It would not.*

> " MR. JUSTICE PITNEY : I understood him to say so yesterday, and I supposed there was something in the record to justify it.
>
> " MR. KENYON : *Nothing.* That will be a part of my argument."

Mr. Kenyon said in his oral argument in this case before the District Court (printed report of Plaintiff's Oral Arguments, pp. 66, 67) that nothing was further from his intention in his answers to Mr. Justice McREYNOLDS' inquiries than to limit the claims to one-half of 1% of oil. In view of the proofs we do not see how he could have answered Mr. Justice McREYNOLDS otherwise. But Mr. Kenyon's *intentions* are immaterial. The simple question here is : what were the facts and arguments presented to the Supreme Court as a basis for the decision reached ?

He also said (printed report of arguments before the Supreme Court, p. 91) :

> " It is apparent now that the inventors in their minute one-tenth of one per cent. oil frothing re-agent were really invoking a characteristic and a power of oil in an ore concentration process that *develops only in that relatively microscopic quantity,* and which is defeated and disappears when that minute quantity is even *slightly* exceeded, a characteristic and a power of oil which had not existed in the prior oil concentration processes of the art, which had never been utilized by anybody for ore concentration, and the very existence of which had not been known or suspected."

Complainant's counsel, Mr. Williams, in his argument before the Supreme Court (printed report of arguments before the Supreme Court, p. 12), said :

> " The amount of oil that we use is generally one-tenth of one per cent. on the ore ; two pounds of oil to the short ton of ore. Every ore presents its own problem, but for a given ore and a given oil there is a certain *critical* factor. The variations in that factor in practice have been from a *trifle less than one pound of oil to the long ton in the case of the rich ores of Australia to four pounds of oil to the long ton in the case of a lean copper*

> *ore at the Braden mines in Chile.** Those are the variations of different oils and different ores, and because of those *minute variations* you have the impossibility of saying that this process always uses just so much; but given any ore and given any oil, the evidence shows that *if you add another pound of oil* your metal particles commence to stick together and commence to fall down in granules, and you get into the Cattermole sinking sphere, whereas, on the other hand, if you *diminish* it, you cease to have that selective action which is essential; you do not get any float in particular and you have gangue in it; so that it is *critical* for a given oil and a given ore, but it has variations."

Plaintiffs' counsel, in their reply brief in the Supreme Court, stated, commencing at page 6:

> "It is the astonishing fact that, so far as the record here shows, with every ore the world over to which the process has been applied and with all the varying conditions of use, the *largest quantity ever used has been 4 pounds to the long ton (i. e., less than 2/10ths of one per cent.)*, and that the smallest quantity has been 9/10th of a pound per long ton of ore (*i. e.*, less than ½ of 1/10th of 1 per cent.)."

Additional quotations from plaintiffs' brief in the Supreme Court, to the same effect, will be found in this brief (*infra*, pp. 33 and 34, also p. 70), and should be read here.

We see, therefore, that not only did the witnesses in the Hyde case, whose testimony is referred to by the Supreme Court in defining the critical proportions to which the patent must be limited, confine those proportions to less than one-half of 1% on the ore, but that plaintiffs' counsel emphasized this limitation in their arguments and briefs before the Supreme Court.

We, therefore, confidently submit that in limiting the invention to the "critical" proportions "often described in the testimony," the Supreme Court limited it to that fraction of 1% which is *less than one-half of* 1%, although the claims in terms are broad enough to cover any fraction of 1% (for example, 0.999%), and that *defendant has not infringed when it has used more than one-half of 1% of oil.*

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*$\frac{9}{10}$ lb. equals 0.045%; 4 lbs. equals 0.2%.

The Court of Appeals for the Third Circuit has Construed the Decision of the Supreme Court in the Hyde Case Precisely as we Construe it.

Since the decision of the Supreme Court in the Hyde case was handed down, that decision has been studied and construed by the Circuit Court of Appeals for the Third Circuit in the Miami case (244 Fed., 752). While the judges composing that Court differed among themselves as to other points, they agreed in construing the Hyde decision, with respect to its rigid limitation of the patent to the use of a small fraction of 1% of oil, precisely as we have construed it.* The following are quotations from the prevailing opinion :

Discussing directly the Supreme Court decision it said (p. 758) :

> "The plaintiff maintains that the language of the Supreme Court supports its broad contentions that 'Whenever the modifying agent of the patent (oil) is used, a person infringes who gets air into the pulp in any fashion and agitates the mixture by any means to a sufficient extent to cause the mineral particles to attach themselves to air bubbles and to rise therewith above the top of the mixture in a collection of bubbles and metal particles, to-wit, froth.'" * * * "Considered in the light of what the Supreme Court said and what it did not say, it is clear that the positions of both parties are extreme. The contention of the plaintiff at least omits the *very definite* limitation of the patent to the results obtained by the use of oil *within the described proportions*, and also the equally definite disclosure of an agitation in violence and duration greater than before employed * * *"

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* It will, of course, be understood that in this brief we are not dealing with the complete interpretation given by the Supreme Court to the patent in suit, or its complete statement as to wherein the invention of the patent in suit consists. The complete statement includes not only the presence of the "critical" proportion of oil (with which this brief chiefly deals), but it includes also an "agitation greater than and different from that which had been resorted to before," and the "resulting froth concentrate so different from the products of other processes."

Still, discussing the Supreme Court decision, it said (p. 759) :

> " We are inclined to the opinion that by this expression the court intended a limitation only upon that one feature of the patent to which the expression was addressed. The District Court had held valid certain claims in which the proportion of oil was described simply as ' a small quantity,' and the Supreme Court, in reversing that finding and holding those claims invalid, used the quoted words of limitation in confining the patent to the results obtained by the use of oil in the *critical proportions of less than 1%*."

Further on in its opinion it said (p. 760) :

> " The affinity of oil for metal was known, and, though old, was employed in the invention ; but that this affinity in a given condition is greatest when its quantity is relatively least, or that the affinity increases with the *decrease of oil below a given quantity (less than 1%), is the* SOUL *of the discovery and was wholly new.*"

Judge BUFFINGTON, in his dissenting opinion, after quoting from the Supreme Court's decision, said, page 776 :

> " It will thus be seen that, first, the *quantity of oil*, secondly, the character of agitation, and, thirdly, the resultant froth, constituted the disclosure."

We see, therefore, that the Court of Appeals for the Third Circuit has unanimously construed the Supreme Court decision as we have construed it.

DEFENDANT NOT ONLY DOES NOT USE THE " CRITICAL " PROPORTIONS OF OIL TO WHICH THE SUPREME COURT HAS LIMITED THE PATENT ; BUT IT DOES NOT OBTAIN THE RESULTS WHICH CAN BE OBTAINED BY THE USE THEREOF.

This Court in its opinion in the Hyde case reviewed the prior art and found that the use of oil in various quantities down to 1% on the ore was old and was known to the patentees of the patent in suit. This finding was in no way disturbed by the Supreme Court. On the contrary, because

it was accepted by the Supreme Court that Court held that claims 9, 10 and 11, which cover the use of a "small quantity" of oil, are invalid; and it held that to be valid the claims must be limited to the use of oil to the "critical proportions", "amounting to a fraction of 1% on the ore."

The Supreme Court differed from this Court only in holding that the superior results obtained by reducing the quantity of oil to a fraction of 1% constituted patentable subject-matter.

The defendant does not use a fraction of 1% of oil, and it does not obtain the results which could be obtained by the use thereof. Thus, in the brief for plaintiffs in the Court below, the following appears* (pp. 107 to 111):

> "That defendant's practice employing 20 pounds or more of oil is metallurgically and financially inferior to its former practice is also clear on the record.
>
> "Mr. Wilding, at Vol. VIII., p. 4642, Q. 136 *et seq.*, and in Plaintiffs' Exhibit 272, institutes a comparison between the last quarter of 1916 and the first quarter of 1917, based upon the figures given in the monthly statements filed by the defendant under order of Court entered in this case on November 15, 1913, those monthly statements from January, 1916, down to and including March, 1917, being Plaintiffs' Exhibits 257 to 271, inclusive. Mr. Wilding shows (Vol. VIII., p. 4645, Qs. 155 to 157) that whereas the zinc recovery for the last quarter of 1916 was 92.941%, it was only 83.110% for the first quarter of 1917, and whereas the average grade of concentrate for the last quarter of 1916 was 53.254% in zinc, it was only 47.228% for the first quarter of 1917. He also shows (Vol. VIII., p. 4646, Q. 162) that whereas in the last quarter of 1916, 19.11 pounds of zinc ran to waste in the tailings for every ton of ore fed to the flotation plant, 43.22 pounds of zinc ran to waste in the first quarter of 1917; and that whereas for the last quarter of 1916 the tailings that ran to waste assayed 1.24% of zinc, the tailings that ran to waste averaged 2.789% of zinc for the first quarter of 1917 (Vol. VIII., p. 4647, Q. 163). He also shows (Vol. VIII., p. 4647, Qs. 164-171) that whereas the total

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* The references in the brief in the District Court were to the typewritten record. These have been changed to refer to the corresponding pages of the printed transcript of record.

cost of the concentration operation for the last quarter of 1916 was a little over 82 cents per ton of ore delivered to the plant, the cost for the first quarter of 1917 was $1.34 per ton of ore. Thus it appears that the operations during the first quarter of 1917, as compared with the last quarter of 1916, lost more of the values in the tailings, achieved a lower grade of concentrate for the smelter, and cost more in the mill. It cost more to achieve less" (Vol. VIII., p. 4648).

* * * * * * *

"These two periods were chosen as the nearest together in point of time and therefore the closest approximations to each other in the matter of mill development in process and machinery.

"There was a small difference, however, in the average grade of the ore delivered to the plant during the two periods, that during the last quarter of 1916 showing in zinc 13.446%, and that for the first quarter of 1917, 12.793%. To eliminate this as much as possible as a disturbing factor, Mr. Wilding (Vol. VIII., p. 4648, Qs. 173, *et seq.*), made a comparison of each one of the three months of the first quarter of 1917 with that particular month of the year 1916 that was substantially identical with it in the grade of the ore fed to flotation, the comparison being set out in Plaintiffs' Exhibit 273; and this comparison does not stop with the matter of cost but is carried out to show the comparative profit of the two contrasted practices, assuming a sales value of concentrates on equal terms and in accordance with actual market conditions, as shown in Appendix A to said Exhibit 273, and explained by the witness. This method of comparison selected January, 1916, for contrast with March, 1917; June, 1916, for contrast with February, 1917; and November, 1916, for contrast with January, 1917. The results may be briefly set out as follows:

As to grade of concentrate in zinc (Plaintiffs' Exhibit 273, Column 6) for January, 1916, it was 54.593% as against 47.207% for March, 1917; 54.579% for June, 1916, as against 45.639% for February, 1917; and 53.524% for November, 1916, as against 48.820% for January, 1917.

"As to zinc recovery (Vol. VIII., p. 4651, Qs. 187–192) for January, 1916, 93.117% as against March, 1917, 85.228% for June, 1916, 93.972% as against February, 1917, 81.155%; November, 1916, 92.929% as against January, 1917, 82.858%.

"As to zinc running to waste in the tailings (Vol. VIII., p. 4652, Qs. 198–202) for every ton of ore treated 19.23

pounds of zinc ran to waste in January, 1916, as against 36.90 pounds in March, 1917; 15.65 pounds in June, 1916, as against 48.95 pounds in February 1917; and 18.39 pounds in November, 1916, as against 44.30 pounds in January, 1917. The percentage of zinc in the tailings (Vol. VIII., p. 4653, Qs. 204–208), was in January, 1916, 1.093% as against 2.382% in March, 1917; for June 1916, 1.007% as against 3.183% for February, 1917; and 1.187% for November, 1916, as against 2.838% for January, 1917.

"As to cost of operation (Vol. VIII., p. 4654, Qs. 214–216) the difference in favor of the earlier period in each case was 70 cents per ton of heading in January, 1916, over March, 1917; 56 cents in June, 1916, over February, 1917; and nearly 57 cents in November, 1916, over January, 1917.

"As to the sales value of the concentrates produced, figured on the basis of equal terms and as set out by Mr. Wilding in his Appendix A to Exhibit 273 (Vol. VIII., p. 4658, Q. 245), a difference in favor of the earlier period in each case is shown, namely of $65,417.00 in January, 1916, over March, 1917; of $121,526.00 in June, 1916, over February, 1917; and of $104,599.00 in November, 1916, over January, 1917.

"As to the ultimate profit per ton of heading (Vol. VIII., p. 4659, Qs. 252–254), the difference in favor of the earlier period in each case is $1.60 per ton of heading in January, 1916, over March, 1917; $2.05 per ton of heading in June, 1916, over February, 1917; and $1.81 per ton of heading in November, 1916, over January, 1917.

"As a final conclusion (Vol. VIII., p. 4650, Qs. 256–258 and Note on Plaintiff's Exhibit 273), Mr. Wilding says that the figures indicate that the modification of the operation by the use of excess oil would cause a decrease of profit from the zinc alone of about $1.75 per ton on all ore delivered to the flotation plant, that the capacity of the mill has by the change been reduced, and that to keep up the tonnage capacity it would be necessary to provide more equipment in the mill. He points out also that the silver loss is somewhat greater, and that with the market price of spelter at 9½ cents, which is conservative, the decrease of profit on one year's treatment, say on 580,000 tons, would be about $1,015,000.

"Mr. Wilding's work in this regard is purely arithmetical and is accurate. It has not been criticised by any witnesses for defendant, nor have his conclusions been criticised."

It will be seen, therefore, that according to plaintiff's own figures defendant has sacrificed *about a million dollars a year* in recoveries and added expenses in avoiding trespass upon the rights of the plaintiffs, as they have been defined by the Supreme Court ; and that, therefore, the defendant not only does not use the " critical proportions " of oil to which plaintiffs' patent is limited, but it is not obtaining the results which could be obtained by the use of such " critical proportions ".

What the Supreme Court sustained the patent for is the difference between the results produced by the use of a fraction of 1% of oil and the results produced by the use of larger quantities of oil.

When the Supreme Court condemned the claims which were broad enough to cover the use of any " small quantity " of oil, it was fully advised of the fact that using larger quantities of oil than 1% would produce a metal-bearing froth which differed from the froth produced by the use of a small fraction of 1%, only in that the former contained more oil and gave inferior results. Concerning this froth, plaintiffs said that it was " *A froth* ", but was not " THE *froth* ". Defendant's froth, being obtained by the use of more than 1% of oil, is necessarily more oily than one produced by the use of a small fraction of 1% ; and, as we have seen, plaintiffs' counsel admit it produces inferior results. Defendant's froth is, therefore, the froth which plaintiffs themselves in the Hyde case told this Court and the Supreme Court was not THE froth of their patent.

As we shall now show, both sides agreed in the Hyde case that a metal-bearing froth can be produced by the use of more than 1% of oil. Defendant's witnesses testified in the Hyde case that in an experimental apparatus a highly useful mineralized froth could be produced by the use of quantities of oil many times 1% on the ore. This fact was nowhere denied by plaintiffs. All plaintiffs said was that recoveries as high as those obtained in *experimental apparatus* could be obtained in *mill operations.* Plaintiffs, indeed, admitted that recoveries substantially as high as those claimed for their process in the specifications of the patent in suit could be obtained, and had been obtained by them, in mill operations, with the use of more than 1% of oleic acid, the specific oil men-

tioned in the patent in suit. Concerning these froths, plaintiffs said in substance: "We admit they are *metal-bearing froths* but they are not OUR froth. OUR froth is a *dry* froth, is one which is obtained by the use of the *most economical quantity* of oil, and is one which contains the *maximum* amount of metal. These froths produced by the use of more than 1% of oil are *oily* are *wasteful of oil* and contain *less metal.* They are not, therefore, THE froth of the patent."

Thus, Hyde, in the Hyde case, described a series of tests using oil above 1% on the ore. In one test he used 32.4 pounds of oleic acid per ton, which would be a little more than 1.5% (Tr., Vol. IV., p. 1406). In another, he used as much as 72 pounds of straight cotton-seed oil per ton, which is 5.6% (Tr., Vol. IV., pp. 1406 and 1407). In both cases he obtained a highly mineralized froth and good recoveries. Samples of the ores used and a duplicate of the machine used were furnished to the plaintiffs (Vol. IV., p. 1435, x-Q. 105; also p. 143 7; also pp. 1570 and 1571). The results of these tests were never questioned by plaintiffs' witnesses.

So also defendants' expert, Dr. Byrnes, testified to certain experiments made by him with different large quantities of oil (Vol. IV., pp. 1528 to 1530). He used more than 3.6% of cotton seed oil in one experiment; and the same amount of olive oil in another experiment; and the same amount of oleic acid in another experiment; and one-half the quantity of oleic acid (to wit, 1.8%) in another experiment. In all cases he obtained a highly mineralized froth and good recoveries.

These facts were not denied or questioned by plaintiffs' experts in the Hyde case. All that plaintiffs' experts said was, that these high recoveries obtainable on an *experimental machine* could not be duplicated in *mill operations.**

While plaintiffs' witnesses denied that as good recoveries could be obtained in mill operations as were obtained in

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* Although plaintiffs' witness Chapman admitted (Vol. II., p. 282, Q. 109):

> "The results produced by the agitation-froth process in practiee have been on every occasion that has come under my own personal observation, an *improvement* on the result obtained in the slide machine."

slide machines when using large quantities of oil, they did not deny that, even in mill operations, a copious mineralized froth could be obtained thereby which effected concentration. All they contended was, that the froth was more "*oily*" and not as "*dry*" as the froth produced by the use of a small fraction of 1%, and that it did not produce as *high recoveries* as could be produced by the use of a small fraction of 1%. They said it was an "oil froth" and not an "air froth," and they said it was not, therefore, THEIR *froth*.

For example, plaintiffs' expert Chapman (Vol. III., p. 939, Q. 250), used in a plant 1.8% *straight oleic acid*, and obtained a froth recovery of 69.78% zinc, and 70.40% lead. While this is not as good a recovery as Hyde and Byrnes obtained in their slide machine experiments above referred to, yet it was a very good result, as is indicated by the fact that the patent in suit only claims for the process a recovery of "about 70% to 80%" (p. 1, line 105).

So, Higgins reproduced in a plant Dr. Byrnes' experiment, using 3.6% *straight cotton-seed* oil (Vol. III., pp. 929, 930), and obtained a "copious" froth which "though oily in appearance *when closely examined*, did not differ in appearance from the usual agitation froth at a *distance of a few feet.*" It is true that Higgins did not get as high recovery as did Byrnes, but that is beside the point. The point is, he admits that a mineralized froth was produced and a grade of concentrate which was 47.50% was obtained by the use of 3.6% straight cotton seed oil. Admitting that this froth was more oily than a froth produced with a small fraction of 1% of oil (as, of course, it must have been), and admitting his contention that the recovery when using 3.6% was less than when using a small fraction of 1%, the fact remains that he admits that froth concentration can be produced by using straight oils in quantities above 1% on the ore ; and this fact was before the Supreme Court when it condemned as too broad claims 9, 10 and 11.

The view advanced by plaintiffs' expert Dr. Liebmann, which was evidently adopted by the Supreme Court, is that the froth produced by the use of an excess of oil above the minute and economical proportions set forth in the patent, is not THE froth of the patent in suit. Concerning the

experiments of Dr. Byrnes above referred to, Dr. Liebmann said (Vol. III., p. 678):

> "He then used the same process with very much larger quantities of oil and states again that he obtained a froth. There may be what is *popularly called a froth*, but this froth differs in characteristic qualities from THE froth produced with the quantities of oil described by the patentees of the patent in suit as suitable and economical. It contains large quantities of oil which are quite visible and can even be detected by the touch. The appearance of the minerals is changed. They have a dull look and lack the metallic luster of minerals. The agitation froth produced with the quantities of oil which the patent in suit informs you are suitable, does not disclose the presence of any oil. The faint traces of oil which must be there are absolutely invisible and only a careful chemical analysis can show their presence. To the touch the concentrates thus obtained are the same as the ordinary mineral which had never been treated with any oil. I cannot understand why Dr. Byrnes produced these experiments. He only proves that he can produce, with much larger quantities of oil than are considered economical by the patent in suit, *a froth*, but at the same time he proves that the quantities recommended as economical in the patent in suit are economical."

Further he said (Vol. III., p. 828):

> "A. I have myself not made such an experiment and I am not speaking from personal experience. I am of opinion, as I stated, that if a froth is produced with quantities of oil such as are used in four or five experiments, it must lack some of the characteristics of THE agitation froth; that is, for instance, it would not show the metallic lustre and would be oily."

Further he said (Vol. III., p. 837):

> "A. I have seen many times concentrates produced even with much smaller quantities of oil than used by Dr. Byrnes, and in each case I found the appearance greatly different from the appearance of THE agitation froth. Even quantities *as small as 1.5 per cent.* alter the look of the mineral particles."

In using more than 1% of oil on the ore, defendant obtains, and must necessarily obtain, a froth which is "oily"

compared with the froth which is produced by the use of a small fraction of 1% and, as shown above *(supra*, pp. 21–25), defendant does not, in fact, obtain as good recoveries as it previously obtained when using a small fraction of 1%. Hence, defendant is now doing only what the Supreme Court has said, in condemning claims 9, 10 and 11, it has a right to do.

Judged by the standard which plaintiffs applied to distinguish the froth of the patent from prior-art froths, defendant does not infringe. Defendant's froth is of necessity more *oily* than a froth produced by the use of a small fraction of 1% of oil. It is produced by an *uneconomical* use of oil. It carries *less values.*

That which does not anticipate, if earlier, cannot infringe, if later. To hold that defendant infringes when it uses more than 1% of oil, would be to say that the defendant infringes when it uses prior-art quantities of oil. It would be equivalent to saying that by the issuance of the patent in suit the public has been deprived of the right to continue to do what it had done before these patentees entered the field.

The Decision Below in Detail.

As we have said, the opinion below (Tr., Vol. I., p. clxxvii) seems to us to be a reaffirmance in all respects of the District Court's opinion in the Hyde case, *including the errors in it which have been condemned by the Supreme Court.* The District Court, we think, erred in not giving sufficient weight to that part of the Supreme Court's opinion beginning with the statement: " While we thus find in favor of the validity of the patent, we *cannot agree with the District Court in regarding it valid as to all the claims in suit* ", and ending with declaring claims 9, 10 and 11, covering the use of any " small quantity " of oil, invalid. In fact, the District Court now intimates that the Supreme Court committed error in condemning these claims 9, 10 and 11, for, referring to the fact that the Supreme Court has condemned them, it says (Vol. I., p. clxxxviii., line 17):

> " With the later knowledge of this suit it is *doubted whether such would be the decision now.*"

As we have seen, the plaintiffs in the Hyde case, by their witnesses and by their counsel, told the Supreme Court that the invention consisted in the use of a critical amount of oil, and the Supreme Court found such to be the fact. The District Court, however, boldly says such is not the fact. It says (Vol. I., p. clxxix.):

> "The tendency was to attach *prime importance to reduction in amount of oil used*, when in fact this is but a *necessary incident (for which there are substitutes if not equivalents) to the creation of the infinitude of bubbles that do the work.*
>
> * * * * * * *
>
> "These 'critical proportions' are like those *known to and solved by every child with its pipe and bowl of suds.* Too little soap, the bubbles are few, small, fragile, and break quickly. Too much soap, they flow from the pipe in a torrent, are heavy, and refuse to float. The right amount of soap, the 'critical proportions,' his bubbles are large, detach readily and float high, far and for long. So it is with the bubbles in this process (p. clxxxii.).
>
> * * * * * * *
>
> "It seems clear *neither patent nor decision undertakes to say the process depends upon less than 1 per cent. of oil* or is inoperative with 1 per cent. or more of oil.
>
> "It is true that *in the beginning and during the Hyde suit the patentees inclined to so believe*, or at least believed better results would be obtained with a fraction of 1 per cent. of oil. *Perhaps limited investigation and experience with few ores and oils justified the belief.*" (p. ccxxxvii.).

Indeed, the District Court in this case, instead of being guided by the finding of the Supreme Court, that the essence of the patented process resides in the use of a fraction of 1% of oil, has advanced and adopted a theory of operation, and of the difference between this process and prior-art processes, which is different from and inconsistent with the theory adopted by the Supreme Court; and which new theory, so far as we know, was never suggested by plaintiffs' witnesses or by their counsel. It finds that the essence of the patented process resides in the creation of an "*infinitude of bubbles*" in the pulp. If plaintiffs' witnesses or counsel had advanced such a contention, it would have been easy to dispose of it conclusively.

Indeed, plaintiffs' witnesses and counsel have themselves stated in the most explicit manner that in the practice of the old Cattermole process they used the same agitating apparatus, and operated it at the same speed, as in practicing the process at bar. Using the same agitating apparatus and operating it at the same speed must necessarily have beaten into the pulp the same " infinitude of bubbles." For example, plaintiffs' counsel in their brief before the District Court in this case (p. 23), said :

> " It is the actual fact that the degree of agitation employed by the patentees in and by the use of the Gabbett mixer at the birth of the invention in suit was *identically the same in every respect* with the agitation that they had been employing for the Cattermole process. The *same machine* was used, the *same speed of rotation* was used, the pulp was manipulated in *identically the same way.* There was no doubt of this fact on the face of the Hyde record, as it went up in somewhat abbreviated form to the Supreme Court, but even if that were not so the actual fact has been proved in this case (Higgins, Tr., Vol. VIII., pp. 4533–4, Qs. 354–358). Not only was the *same identical Gabbett mixer* in use in the spring of 1905 both for the Cattermole process and for the process of the patent in suit, and *rotating at identically the same speed*, but this was repeated in Court at the present trial in several demonstrations, * * * "

Clearly, therefore, plaintiffs' counsel cannot and do not say that the process at bar differs from the Cattermole process in the number of bubbles introduced into the pulp.

So, also, with respect to the process which Froment communicated to these patentees December 29, 1903, which was seventeen months before the application for the patent in suit was filed, and long before the earliest date alleged as the date of conception of the invention at bar.* A comparison of Froment's Instructions with the early practice of the invention at bar in Australia (where it was first practiced commercially)

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* Referring to the Sulman & Picard Report dated March 3, 1905 (Tr., Vol. III., p. 1106), plaintiff's counsel said in their brief below (p. 68) : " This is the earliest document describing the invention and fixes the date of invention as between March 3 and March 10, 1905."

shows that precisely the same speed of rotation of the mixers and the same period of agitation was employed, so that the same " infinitude of bubbles " must have been present in one case as in the other. In fact, the only difference between the two process is that in one case (Froment) 1% or more of oil was used, and in the other case (patent in suit) something less than 0.1% of oil was used.

Froment's Instructions are found in Volume III, pages 996 to 1003, and the description of the early practice of the invention at bar in Australia is described in the testimony of Wincey, Volume II, pages 506 to 511.

The following references are all to the record in the Hyde case as reprinted in this case :

Froment instructed the patentees to run the mixers at " about 300 revolutions per minute " (Tr., Vol. III., p. 996). In Australia they run the mixers " from 265 to 270 revolutions per minute " (Tr., Vol. II., p. 511, x-Q. 48).

Froment instructed the patentees to agitate the pulp in the mixers " about ten minutes " (Tr., Vol. III., p. 1000). In Australia the pulp was subjected to agitation in the mixers " from 5 to 10 minutes " (Tr., Vol. II., p. 511, x-Q. 49).

Froment, however, instructed the patentees to use from 1% to 2% of oil on the ore up to 15% metalliferous content (Tr., Vol. III., p. 1000) ; while in Australia they used " from 0.9 to 1.3 pounds per ton," which is about 0.05% (Tr., Vol. II,. p. 505, Q. 21).

This testimony conclusively proves that precisely the same " infinitude of bubbles " must have been introduced into the pulp by Froment as by the patentees in the practice of the process at bar.

If, therefore, plaintiffs' counsel had advanced in this case (as they did not) the " infinitude of bubbles " theory, it would have been easy for us to demolish it on their own proofs.

The Court below found infringement in the use of more than 1% of oil on the theory that :

(1) Since a small fraction of 1% will do the work as well as, or better than 1% or more of oil, all the oil used by the defendant above a small fraction of 1% is useless and wasted, or worse.

(2) Because a larger quantity always includes a smaller

quantity, in using 1% and more of oil defendant uses a fraction of 1%.

(3) By using a fraction of 1% defendant infringes the claims sustained, and it does not escape infringement by using unnecessarily and wastefully and detrimentally a larger quantity.

Our answer is that if this were a case in which the patentees were the first to use oil in any quantity for flotation purposes, the fact that the defendant unnecessarily and uselessly and detrimentally employs larger quantities than those described in the specifications, might not avoid infringement; and in such a case the logic of the decision below might be sound; but, under the particular facts of this case, the logic of the decision below completely annuls the limitations which the Supreme Court has placed on the claims sustained, and directly contradicts the theory on which the Supreme Court sustained the claims which are limited to the use of a fraction of 1% of oil and condemned the claims limited only to the use of a "small quantity" of oil.

That only "minute" and "critical" quantities of oil would produce THE froth of the patent in suit, is a fact reiterated by plaintiffs' counsel throughout their entire brief before the Supreme Court in the Hyde case. Beginning on the very first page of that brief they said:

> "The distinctive feature of the invention patented is the employment of air bubbles in co-action with a *minute and critical* amount of oil in a mixture of ground ore and water so as to produce upon the surface of the water a froth containing substantially all of the metallic particles which can be easily flowed off or removed.
>
> "This process was never used before. This result was never obtained before. The process is dependent upon the use of oil in a *minute and critical* amount and thorough aeration. If *more* oil is used, you do not operate the process, and you do not get the result. So also if *less* oil is used the process is not operated and the result is not obtained. By using *other and greater* quantities of oil you operate a different process and you obtain wholly different results. That the *critical* amount of oil characterizing the process is a *minute* amount of oil (varying slightly with different ores and different oils) is merely a fortuitous circumstance. Nevertheless the process is *dependent upon such definite minute* amount of oil."

On page 6 they said :

> " The secret of the invention of the process in suit was the discovery that by the agitation and aeration of an ore pulp (water and finely ground ore particles, the water, when in motion, carrying the ore particles in suspension therein) in the presence of a *mere trace* of oil, such that the metal particles were coated with a thin attenuated coating of oil, *so thin as to be imperceptible to sight or touch and so attenuated as to exhibit none of the known properties of oil*, air bubbles would be produced and controlled and made persistent, that would firmly attach themselves to the metallic particles and by their buoyancy float the heavy metallic particles upward to and through the surface of the pulp, and form above and resting upon the surface of the pulp a floating layer—usually several inches in thickness—of a mineral froth constituted of such air bubbles carrying the metallic particles. This was accomplished in practice by the employment of oil in the *minute proportion of one-tenth of one per cent.* on the ore."

On page 11 they said :

> " From the above evidence of defendant and other abundant evidence in the record it appears that for a given ore and a given oil, a *definite minute* amount of oil is *essential* to the carrying on of the process ; that *any substantial increase or diminution of this critical quantity* of oil impairs or destroys the process ; and that the production of the peculiar mineral froth characteristic of the process is recognizable by metallurgists skilled in this new art as an infallible indication of the use of the process.
>
> * * * * * *
>
> " The history of the art demonstrates that with the conjoint use of air and oil, flotation-concentration is wholly impracticable unless the *minute* quantity of oil *characterizing* the process in suit is used."

Here is a case in which the plaintiffs, in order to sustain their patent, told the Supreme Court that the result sought could be obtained only by limiting the oil to " critical " and microscopic quantities, and that prior art processes which used larger quantities of oil and which, therefore, necessarily produced a more " oily " froth less economically did not anticipate.

This Court found in the Hyde case (and this finding was in no way disturbed, but was, on the other hand, affimed by the Supreme Court), that Froment gave instructions to the patentee to use as little as 1% on some ores, and that Cattermole described the use of less than 1% on some ores. And yet when defendant uses larger quantities than Froment recommended and Cattermole directed, the Court below has found that it infringes nevertheless, because the excess oil is " wasted ". Plaintiffs obtained a favorable decision from the Supreme Court by convincing it that the presence of more than 0.5% of oil on the ore would defeat the process. The Court below has found that it will not defeat the process but will only " waste " oil.

Defendant does not use more than 1% of oil because it cannot use less and obtain more satisfactory results. It uses it because the Supreme Court has said it is not at liberty to use less than 0.5% but that it is at liberty to use more than that. Out of abundance of caution, and dreading the fire like every burned child, defendant has used not only more than 0.5%, but it has used more than 1% of oil on the ore. To respect the property rights of the plaintiff as defined by the Supreme Court is, as we have shown (*supra*, p. 25), costing the defendant in reduced recoveries and increased costs over a million dollars a year. Of course, in one sense it is true that any excess oil above the smallest quantity which will do the work is " wasted." What the Supreme Court has held is, that the soul of this invention is the avoidance of that " waste ", with the superior metallurgical results and the less " oily " froth incident thereto. Defendant has not avoided that " waste " with its accompanying disadvantages of lower recoveries and a more " oily " froth, and therefore it has not infringed.

Again the Supreme Court held that the claims of the patent which were broad enough to cover the use of any " small quantity " of oil were too broad and were, therefore, invalid ; yet the Court below has, in fact, expanded the claims which were sustained by the Supreme Court so that they cover the use of oil in any quantity *however large it may be*, so long as it will produce a metal-bearing froth. In so doing, it has totally neutralized the decision of the Supreme Court condemning

claims 9, 10 and 11, for, by construction, it has expanded the other claims to fully cover the territory of the condemned claims and more. It has expanded the sustained claims to cover not only the use of any " small quantity " of oil, but to cover the use of even a *large* quantity, on the theory that the oil which is used above a small fraction of 1% is wasted and it is not to be reckoned as the oil of the claims. We submit that any process of reasoning which arrives at this conclusion is essentially fallacious.

Plaintiffs' counsel said in their brief before the District Court in the Hyde case, that claims 9, 10 and 11 were intended to cover a " *wasteful use of oil* "—precisely what they say, and what the Court below has said, the defendant is doing when it uses anything more than a small fraction of 1% of oil. In condemning these claims, therefore, the Supreme Court has said the plaintiff is entitled to cover the use of " minute " and " economical " quantities of oil, but it is not entitled, in view of the prior art, to prevent others employing a larger and " wasteful " amount of oil. Thus, at page 11 of their brief, plaintiffs' counsel said :

> " Claims 9, 10 and 11 are the broadest claims. While clearly limited to the new agitation-froth phenomenon, they are not limited as to oil quantities except that the oil must be ' a small quantity.' These claims have a broader scope than has as yet proved to be necessary for the protection of the agitation-froth invention, since no mine owner will use an ounce more of oil than is necessary, and the ores so far tested have not required more than the higher limit of the limited claims, but these claims would cover a *wasteful use of oil* such as defendant has suggested the possibility of."

It was the claims covering the " *wasteful use of oil* " that the Supreme Court declared invalid. Notwithstanding this, the learned District Judge has found in this case that the valid claims cover the " wasteful " use of oil.

Furthermore, the distinction which the Court below makes between a beneficial use and a wasteful use of oil, holding that if the excess above a small fraction of 1% were beneficial it would be no infringement and finding infringement because it is detrimental, ignores entirely the theory on which the

patent was differentiated from the prior art and sustained. He says (Tr., Vol. I., p. cxci) :

> " If the excess oil were effective and useful, and not inert, useless and harmful, it would be without the claims of the patent, would be of that the patentees abandoned to the public, and *would involve no infringement.*"

We show *(supra*, pp. 25–29) that plaintiffs admitted in the Hyde case that a metal-bearing froth could be produced by prior-art quantities of oil. Admitting this, they said that such froths were not THE froths of the patented process, because they were *more oily*, were *not produced economically*, and *carried less metal.* When the defendant now produces a froth using the prior-art quantity of oil, which froth is *more oily* than the froth produced by the quantities of oil specified in the patent, and is *less economical*, and carries *less metal*, the Court below finds that it infringes *for that reason.* So a process which was held not to anticipate because it was more wasteful and less efficient, is held to be an infringement, *for the reason that it is more wasteful and less efficient !*

The Claims Cannot be Stretched to Cover the Use of Oil in More Than the "Critical Proportions" by the Application of the Doctrine of Equivalents or by Any Other Expedient.

Cases were quoted in plaintiffs' brief below in support of the proposition that infringement may be found where the letter of the claim is avoided. That proposition is undoubtedly sound, but, like other sound legal propositions, it is surrounded by limitations. If this were not true, claims would be meaningless and superfluous. If this were not true, the provisions of the Statutes (Sec. 4888), which require the patentee to "*particulary point out and distinctly claim* the part, improvement or combination which he claims as his invention or discovery " would be a dead letter.

Plaintiffs cannot by resorting to the doctrine of equivalents, or by any other expedient, wipe out of their patent any limitation which the Supreme Court has imposed upon it.

This case is on all-fours with the case of *Union Metallic Cartridge Co. vs. U. S. Cartridge Co.*, 112 U. S., 624. In that case the patent related to a machine for making cartridge cases. The machine as described in the patent contained a movable die and a stationary bunter. Defendant used a stationary die and a movable bunter, which plaintiff contended was an equivalent, and which ordinarily would be regarded as an equivalent. But as a condition to extending the patent, the Commissioner of Patents had required the patentee by disclaimer to erase the description of a stationary die and movable bunter, which did not appear in the patent as originally issued, but which had been added by a reissue. The Supreme Court, speaking by Mr. Justice BLATCHFORD, said that it did not make any difference whether a stationary die and movable bunter, such as the defendant used, was, or was not, as a matter of fact, the equivalent of a movable die and stationary bunter, such as the patentee described. The facts of the case, the Supreme Court said, were such as to prevent the patentee (p. 645)

> "being *heard to allege* that persons who use machines with a stationary die D and a movable bunter E infringe the claims of the reissue. * * * *The question of fact is not open now* as to whether Allen invented at any time the stationary die D and movable bunter E, or as to whether it was, or is, or could be, a mechanical equivalent for the movable die D and stationary bunter E, because those questions are concluded by the disclaimer."

The same reasoning applies in this case. Having secured a favorable decision in the Supreme Court on the allegation that a larger amount of oil *is not* the equivalent of the " critical proportions," plaintiffs will not be " heard to allege " that a larger amount of oil *is* the equivalent of the " critical proportions." This " question of fact is not open now."

The allegations of plaintiffs' witnesses and counsel in the Hyde case and in this case on the central fact as to the quantity of oil which characterized their process are flagrantly inconsistent. In the Hyde case they alleged that the use of a small fraction of 1% produced results which were *essentially different* from those produced by the use of

any larger quantity of oil; and it was because the Supreme Court believed these allegations that it sustained their patent; but in doing so the Supreme Court was careful to limit the patent to the use of such "critical proportions" of oil. In this case they allege that the use of larger quantities of oil produce results which are *substantially the same* as those produced by the use of a small fraction of 1%; and on this allegation they ask this Court to find the defendant an infringer when it uses 1% and more of oil. If they were right in the Hyde case, they must be wrong in this case. If they are right in this case, they must have been wrong in the Hyde case; and, furthermore, in that event the decision of the Supreme Court was certainly wrong, because it was based on a misapprehension of the central fact of the case. It would produce an intolerable situation if the plaintiffs, after having *sustained* their patent in the Supreme Court on the theory that more than the critical proportions of oil will produce *substantially different* results, should now be permitted to hold defendant as an *infringer* on the theory that they will produce *substantially the same* results.

The Supreme Court, however, has wisely relieved this Court of the burden of considering any question of estoppel. Believing the allegation of our adversaries that only the "critical proportions" described in the specifications and in the testimony of the witnesses would produce THE froth of the patent, and sustaining the patent by reason of that belief, the Supreme Court was careful to specifically and rigidly limit the patent to the use of these proportions of oil. Hence, this Court has only to apply the patent as thus limited by the Supreme Court to the facts in this case, and thus applying the patent it must find non-infringement in the use of any quantity of oil above the so-called "critical proportions" of the Hyde case. What plaintiffs' counsel ask this Court to do is to wipe out the specific limitation which the Supreme Court has imposed on their patent as a condition to sustaining those claims which were sustained.

In condemning claims 9, 10 and 11 the Supreme Court had before it the very argument which is presented to this Court as a reason why it should stretch the other claims to cover defendant's practice when it uses quantities of oil above the

"critical proportions." In plaintiffs' main brief before the Supreme Court (p. 55) counsel said:

> "Claim 9 is the broadest claim. The amount of oil is stated to be 'a small quantity.' The process is stated to include 'coating the mineral with oil in water containing a small quantity of oil, agitating the mixture to form a froth, and separating the froth.' The essentials of agitation of the ore in powdered form diffused in water in the presence of a small quantity of oil, so as to form a froth and thereby to utilize air bubble separation, are set forth, as well as the completion of the operation of concentration or separation by separating the froth. The novelty of the invention as thus defined is unquestionable. *Conditions may well arise in the future wherein the critical oil proportion is increased by reason of a useless absorption of the oil within the pores of a gangue material, or wherein an oil or a mixture of oils is employed having unusual characteristics, as a result of which the critical oil proportion may be one per cent. or slightly more. Under such conditions this and the two following claims may be necessary to protect the invention.*"

Plaintiffs' expert witness, Dr. Chandler (Tr., Vol. II., p. 208), concerning claims 9, 10 and 11, said in the Hyde case:

> "In *claims 9, 10 and 11* no maximum figure is given for the amount of oil to be employed. The expression is simply 'a small quantity of oil,' which, as I understand the language of patent literature, would mean a quantity small enough to accomplish the result described and claimed in the patent, the specification of which clearly indicates that, although the quantity may be variable, it is *somewhere about one per cent. or under.*
>
> "The patentees have selected as the oil to be used in their example oleic acid, and claims *5, 6 and 7* mention this particular oily substance and also mention a proportion which may vary from 0.02 to 0.5 per cent., having evidently found that this is a *sufficient* margin of variation in quantity."

It was with this argument and this testimony before it that the Supreme Court in effect said: "No; you are not entitled to those claims 9, 10, and 11, because they are too

broad. The full extent of the monopoly you are entitled to is the use of oil in the 'critical proportions.' Beyond these proportions lies the public domain."

In other words, the condemnation by the Supreme Court of claims 9, 10 and 11, in view of the arguments presented on behalf of the plaintiffs, is a direct and final answer to the plaintiffs' contentions in this case.

PLAINTIFF'S THEORIES THAT THE OIL OF THE CLAIMS IS ONLY THAT PART WHICH IS ATTACHED TO THE METALLIFEROUS CONTENT OF THE CONCENTRATES, AND THAT PETROLEUM OIL IS NOT INCLUDED WITHIN THE TERM "OIL," AS USED IN THE SPECIFICATIONS AND CLAIMS, ARE NOT SUPPORTED BY THE FACTS AND WERE NOT ADOPTED BY THE COURT BELOW.

In the Court below plaintiff's counsel argued that the claims sustained by the Supreme Court were infringed by the use of 1% or more of oil, on two theories:

(a) It was contended that in reckoning the amount of oil which is specified in the claims, account only should be taken of the oil which is attached to the metalliferous content of the concentrates.

(b) It was contended that the petroleum constituent of defendant's oil mixture (being 76% of the whole) does not have a "preferential affinity for metalliferous matter over gangue," and is not, therefore, included within the term "oily liquid" as used in the claims.

Neither of these contentions were sustained by the Court below. The contention that only the oil which is attached to the metalliferous content of the concentrates should be taken into account, is so fanciful that it was not even referred to by the District Court in its opinion. The contention that petroleum is inactive and does not have a "preferential affinity for metalliferous matter over gangue" as required by the claims of the patent, was directly held to be unsound. The Court below said (Tr., Vol. I., p. clxxxi.):

> "Another (quality of oil) of lesser importance, and which *all oils possess* is the '*preferential affinity for metalliferous matter over gangue.*'"

(a)

The contention that in reckoning the amount of oil which is referred to in the claims, account only should be taken of the oil which is attached to the metalliferous content of the concentrates, is not based on reason, or on anything in the specifications or claims. It is contradicted by everything therein. Claim 1, for example (which is typical), describes the process as consisting in " mixing the powdered ore with water, adding a small proportion of oily liquid having a preferential affinity for metalliferous matter (amounting to a fraction of one per cent. on the ore), agitating the mixture until the oil-coated mineral matter forms into a froth," etc. Clearly what is described and claimed here is the use of a fraction of 1% of oil on the ore *in the mixture which is to be agitated to produce the froth.* Neither the specifications nor the claims make any reference to the amount of oil which attaches itself to the metalliferous content of the concentrates. The only reference in the specifications to the oil attached to the concentrate is the suggestion (p. 2, line 3) that the froth may be " treated with a dilute solution of caustic alkali, which removes the oleic acid in the form of soap."

Mr. Kenyon, in his oral argument in the Court below (printed transcript of Plaintiffs' Oral Arguments, p. 51), put this contention in another way, but in a way which amounts to precisely the same thing. After saying that we must consider as oil in the process only the oil which is attached to the metalliferous content of the concentrates, he said that from the total amount of oil used must be subtracted all the oil which goes off with the tailings ; all the oil which is absorbed in the gangue of the concentrates ; all the oil which is dissolved in water, etc. This is only saying in a roundabout way that the only oil which is to be counted as the " fraction of one per cent." referred to in the claims is the oil which is attached to the metalliferous content of the concentrates, because when all these things are subtracted there remains only the oil which is attached to the metalliferous content of the concentrates. We have already shown that the specification and claims directly contradict this contention, because the fraction of 1% of oil which is mentioned in them is the oil

which forms part of the mixture which is to be agitated to produce the froth. It is not the oil which is attached to the metalliferous content of the concentrates when the process is completed.

If the fraction of 1% of oil in the ore referred to in the claims is limited to the oil which is attached to the concentrates, then defendant's practice is still further away from the proportions specified in the claims, for Defendant's Exhibit 158 (Tr., Vol. IX., p. 5184) shows that the percentage of oil in the concentrates, when defendant uses more than 20 pounds of oil to the ton of ore, is as much as 1.86% to 2.09%.

(b)

The contention that the petroleum constituent of defendant's oil mixture is inactive and is not included within the term " oil ", as used in the patent in suit, is contradicted by the proofs, as the Court below found *(supra*, p. 41).

Defendant has used various mixtures of oils. The mixture used by it during the joint run on April 29, 1917, which may be taken as typical, was, in round numbers, (Deft.'s Ex. 227 ; Tr., Vol. IX., p. 5292), composed of 24% pine oil, 65% fuel oil, which is a petroleum residuum, and 11% kerosene. Since fuel oil and kerosene differ only in specific gravity, both being petroleum, we may simplify the formula by saying that the oil was composed of 24% pine oil and 76% petroleum, or substantially one part vegetable oil to three parts petroleum. The amount of mixture used was 26 pounds per short ton of ore, *i. e.*, 1.3% of oil on the ore.

On behalf of plaintiffs it is contended that petroleum is inert in the process, and should be neglected in determining the percentage of oil on the ore, within the meaning of the claims of the patent in suit. The suggestion is that petroleum was used only as a diluent to increase the bulk of oil without taking any active part in the process of the patent.

This contention raises the question as to what is the " oily liquid " referred to in the claims. Does it include, or does it exclude, *mineral oils*, as the petroleums are ?

In the specifications the " oily liquid " of the claims is defined (p. 1, line 12) as " oils, fatty acids, or *other substances which have a preferential affinity for metalliferous matter over gangue.*"

The specification then refers to the Cattermole patent No. 777,273 as describing the use of the same "oily substances" in larger proportions. Turning to that patent we find it states (p. 2, line 89):

> "The 'oil' used may be animal, vegetable, or *mineral oil or mixtures of these* or such coal or wood tar products or other substances which exercise, like oils, a *preferential physical affinity for metallic mineral matter as distinguished from gangue.*"

Further on the specifications of the patent in suit say (p. 1, line 62):

> "The proportion of mineral which floats in the form of froth varies considerably with different ores and *with different oily substances*, and before utilizing the facts above mentioned in the concentration of any particular ore a simple preliminary test is necessary to determine *which oily substance* yields the proportion of froth or scum desired."

When we come to the claims we find that they define the oil as "*an oily liquid having a preferential affinity for metalliferous matter.*"

Hence we see that any oily liquid having a *preferential affinity for metalliferous matter over gangue* is included within the term "oily liquid" in the claim. Since there is no question but that petroleums have such *preferential affinity*, and the Court below has in terms so found (*supra*, p. 41), there can be no question but that they are included within the term "oily liquid" contained in the claims.

The fact is, the practice of using a mixture of vegetable oil and petroleum is not peculiar to defendant, nor is it peculiar to a process in which oil is used in quantity above 1% on the ore. On the other hand, it is a practice which is common with those who use quantities below one-half of 1% on the ore, and who are *operating as licensees under the patent in suit.*

Thus plaintiffs' licensee, the Braden Copper Company, uses a mixture of 1 pound American wood tar oil to 3 pounds of Texas oil (petroleum) per ton of ore (Tr., Vol. II., p. 284). At that place, therefore, where only one-fifth of 1% of oil

on the ore is used, the mixture of oils used is precisely like that used by defendant, to-wit, one part vegetable oil to three parts petroleum.

Again, plaintiffs' licensees at the Consolidated Arizona mine use between 2 and 3 pounds of oil to the ton of ore, about one-half of it being Carolina turpentine, and the other half fuel oil and stove oil, both of which are petroleum (Tr., Vol. VII., p. 4100). At this place, therefore, where only about one-tenth of 1% of oil on the ore is used, the mixture of oils used is one part vegetable oil and one part petroleum.

Again, plaintiffs' licensee, the Anaconda Copper Company, uses for the concentration of sands and slimes *kerosene* acid sludge *alone* or a mixture of *kerosene* acid sludge and creosote in quantities between about 0.13% and 0.33% (Tr., Vol. VIII., p. 4291, Qs. 8 and 9, and Plffs'. Exhibits 313–315, Vol. IX., pp. 5555-6).

Furthermore, the alleged infringers in this country, before they adopted the use of oil in quantity above 1% on the ore, used a mixture containing petroleum as one of its components. This was true of the Utah Copper Company at its Magna plant, and also at its Arthur plant; it was true of the Chino Copper Company; and it was true of the Ray Consolidated Company.

Thus, at the Magna plant of the Utah Copper Company, when using less than 0.5% of oil, they always used a mixture of which petroleum (Jones oil) was a constituent (Tr., Vol. V., p. 2689, x-Q. 268; also x-Q. 281, also x-Q. 286). Since more than 1% of oil has been used, they have continued to use Jones oil as a constituent of the mixture (Tr., Vol. V., p. 2693, x-Q. 289).

Thus, the Chino Copper Company, when using less than 0.5% of oil, always used a mixture of which petroleum (Jones oil) was a constituent. Since more than 1% of oil has been used, they have continued to use Jones oil as a constituent of the mixture (Tr., Vol. V., p. 2422, Qs. 42 to 44).

Thus, the Ray Consolidated Company, when using less than 0.5% of oil, always used a mixture of which petroleum (fuel oil) was a constituent. Since more than 1% of oil has been used, they have continued to use fuel oil as a constituent of the mixture (Tr., Vol. VI., p. 3244).

So, as we have said, the practice of defendant in using a

mixture of vegetable oil and petroleum is not peculiar to it, or to the use of quantities of oil above 1% on the ore.

That petroleum is not, as contended on behalf of plaintiffs, inert in the process, is clearly demonstrated by the mill operations at the Arthur Plant of the Utah Copper Company, records of which appear in Defendant's Exhibit 31 (Tr., Vol. IX., p. 4994), which are explained, Transcript, Vol. V., p. 255, Q. 59 *et seq.* In one run (Experiment No. 7) the oil used was 20.33 pounds per ton, it being a mixture composed of 89% of what plaintiffs' witnesses call inactive oils, that is petroleum (30% Jones fuel oil and 59% smelter fuel oil) and 11% of what they call active oils (10% American creosote and 1% Yaryan pine oil). In this run the extraction was 98.4%, and the tailings carried 0.076% copper. The actual amount of so-called inactive oil used per ton was, therefore (being 89% of 20.33 pounds) 18.1 pounds ; and the actual amount of so-called active oil used per ton was, therefore (being 11% of 20.33 pounds) 2.23 pounds. In another run (Experiment No. 20) *substantially the same amount of so-called inactive oil was used alone* (17.84 pounds of a mixture of the same petroleums —*i. e.*, smelter fuel and Jones fuel, in the same proportions). *In this case the extraction was 95.06% and the tailings carried 0.306% copper.* In another run (Experiment No. 17) *substantially the same amount of so-called active oil was used alone* (1.97 pounds of a mixture of the same so-called active oils, that is, American creosote and Yaryan pine, in the same proportions). In this case the extraction was 85.72%, and the tailings carried 0.81% copper. These determinations are not contradicted or questioned, and they prove that the petroleum oil used in this process was by no means inactive or inert. They prove it was, indeed, quite as active and quite as efficient in producing the desired results as was the so-called active oil. Indeed, it will be observed that the petroleum when used alone gave higher extraction than did the so-called active oils when used alone. The highest extraction, however, was attained when they were used together in a mixture, as defendant uses them.

In direct contradiction of the theory of plaintiffs' witnesses that petroleum is an inactive oil and plays no part in the production of foam, Wicks describes what happened one day in the mill of the Chino Copper Co. in the regular course of mill

operations when the supply of petroleum was unintentionally shut off. He says the foam immediately disappeared, and no recoveries were obtained until the supply of petroleum was turned on again. At that time they were using 32.27 pounds of oil per ton of ore (Tr., Vol. V., Qs. 87–91, p. 2433).

See also testimony of Punchon as to the effect of suspending feed of petroleum at the Arthur plant (Tr., Vol. VII., p. 3850, Qs. 8–17).

Furthermore, plaintiff's inventors and expert witnesses admit that petroleum, instead of being inactive in flotation processes, is active and useful.

Thus, in Complainants' Exhibit Sulman & Picard Report of May 3, 1905 (Tr., Vol. III., pp. 1113 to 1125), being the report of the patentees to the chairman of Minerals Separation of the alleged discovery of the invention at bar, they said (Tr., Vol. III., p. 1118) :

> " We may here conveniently note that *other oils* besides Oleic acid may be employed in this modified recovery process, but so far as Broken Hill is concerned, Oleic acid gives by far the best results. *Petroleum residuum* added as emulsion, *paraffine oil alone*,* R_3P_1 and R_1P_3 emulsions, have also been used, and all give small proportions of float, but do not act nearly so vigorously or efficiently on Broken Hill ores as plain Oleic acid."

Furthermore, plaintiff's witness Higgins, says that petroleums (fuel-oil and kerosene), when used with a vegetable oil are " useful in the process in the patent in suit chiefly for the purpose of *preventing the coarse mineral from falling out of the froth* " (Tr., Vol. VIII., p. 4738, Qs. 39 and 40) ; that it prevents " showering ", that is, it helps to keep the mineral from falling out of the froth (Tr., Vol. VIII., p. 4606, Qs. 421 and 422).

Furthermore, plaintiff's witness Chapman, says concerning petroleum (Tr., Vol. VIII., p. 4436, Q. 38) :

> " I have on many occasions used inactive oils, particularly those like fuel-oil, kerosene and stove-oil to

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* " Paraffine oil " is the name by which *kerosene* is known in England. See Tr., Vol. VIII., p. 4740, Q. 50. *Fuel oil*, *Jones oil*, *etc.*, being the heavier fractions left in the still after the gasolene and kerosene have been distilled off, are " petroleum residuums."

> produce a condition of froth in the Spitz box that will maintain a condition of overflow. The addition of these re-agents in small quantities is *extremely useful* for the purpose, and considerably eases up the operating work."

So it is proved that it is the common practice of those licensed under the patent in suit, and others using less than one-half of 1% of oil on the ore, to use petroleum mixed with other oils in the practice of the process, and it is admitted that the petroleum used is active as an oil—not inactive like "milk or sawdust," as Mr. Kenyon said in argument (printed report Plaintiff's Oral Argument, p. 65)—in effecting the concentration which is the purpose of the process.

Nor is it true, as plaintiffs' counsel stated below, that the production of a froth with more than 1% of oil is dependent on the use of a *mixture* of oils. That a mineral-bearing froth can be produced by the use of more than 1% of *straight oil*, was proved by defendants' witnesses, and was admitted by plaintiffs' witnesses in the Hyde case.

Thus, we have already shown *(supra*, p. 26), that defendant's witnesses in the Hyde case demonstrated that using *straight* oleic acid, or *straight* cotton-seed oil, or *straight* olive oil, in quantities much larger than 1%, highly mineralized froths and good recoveries could be obtained in the laboratory. We have shown that these facts were not denied by plaintiffs' witnesses ; that all plaintiffs' witnesses said was that such high recoveries could not be obtained by the use of these oils in mill operations. At the same time, they admitted that recoveries as high as those described in the specifications of the patent in suit could be obtained and, indeed, had been obtained by them, in mill operations, using more than 1% of straight oleic acid *(supra*, p. 27).

It is, therefore, fully established in this case that mineralized froths can be produced by the use of more than 1% of *straight* oil (not a mixture of oils), and that such froths are not distinguishable from the froth produced by a small fraction of 1% of oil except that they are more oily, are produced less economically and do not carry as heavy a load of minerals—all of which features plaintiffs' witnesses, as we have seen *(supra*, pp. 25–29), say are characteristic of defendant's froth when using more that 1% of oil mixture.

THE THEORY THAT THERE IS SOMETHING PECULIAR ABOUT DEFENDANT'S ORE WHICH PERMITS THE USE OF MORE THAN 1% OF OIL IS NOT ESTABLISHED BY THE PROOFS AND WAS NOT ADOPTED BY THE COURT BELOW.

Plaintiffs' witnesses intimate that there is something peculiar about defendant's ore—that it contains an undefined amount of an undefined material, which Greininger called "gangue slime" and which Chapman called "clay gangue" —which makes it possible for defendant to use above 1% of oil—the inference sought to be deduced from this being that but for the presence of the so-called "gangue slime" it would be impossible to practice the process with more oil than given in the examples of the patent. *i. e.*, under one-half of 1%. This testimony is mere speculation and inference, and *being adduced in rebuttal* it could not be replied to directly. It has been, however, sufficiently replied to indirectly by the proofs in the record showing that oil in excess of 1% is being regularly used at other mills than that of the defendant, where there is no suggestion that the ore contains any "gangue slime" (whatever that may mean). The use of oil in excess of 1% on the ore has been, since the decision of the Supreme Court in the Hyde cases, regularly used at the Magna Mill of the Utah Copper Company, as testified to by Conrads (Tr., Vol. V., p. 2655, Q. 129, *et seq.*); at the Arthur plant of the same company, as testified to by T. A. Janney (Exhibit 30, Tr., Vol. IX., p. 4992; also Tr., Vol. V., p. 2549, Q. 34, *et seq.*); by the Chino Copper Company, as testified to by Wicks (Exhibit 26, Tr., Vol. IX., p. 4987; also Tr., Vol. V., p. 2415, *et seq.*), and by the Ray Consolidated Company as testified to by Engleman (Exhibit 44, Tr., Vol. IX.,p. 5033; also Tr., Vol. V., p. 2740, *et seq.*). In each case the mill records of the plants, both before and after the use of oil above 1% on the ore was adopted as the regular mill practice, were produced. The facts established by this testimony, in brief, are given in the foot-note.*

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* At the Magna plant of the Utah Copper Company the change from below 1% to above 1% of oil on the ore was made on December 25, 1916. Before the change was made, the smallest quantity of oil used was in the month of March, 1915, when the average was 1.23 pounds per ton; and the largest

So we see it is not anything peculiar about defendant's ore—the alleged presence of something nebulously called "clayey gangue," but not identified by any analysis, although complainants' experts had plenty of defendant's ore to analyze and by which to prove its constituents, if they had seen fit to do so—which enables the defendant to use more than 1% of oil on the ore, because it is proved that at other mills, where the ore is not the same, amounts of oil in excess of 1% are being commercially and continuously used.

As a matter of fact, complainants' witness Chapman admitted that even if there were no "clay gangue" in defend-

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quantity used was in the month of April, 1916, when the average was 5.37 pounds per ton (Tr., Vol. V., p. 2648, Qs. 92, 93). Before the change, a mixture of various oils, including petroleum was used. In August, 1915, they used a mixture of Barrett creosote, Barrett No. 4, Jones oil, pine oil, and an oil called No. 642, which is a reconstructed pine oil (Tr., Vol. V., p. 2689, x-Q. 268). In August, 1916, they used a mixture of Jones oil, creosote and waste oil (Tr., Vol. V., p. 2691, x-Q. 281). In December, 1916, before the change was made, they used a mixture of Jones oil and creosote (Tr., Vol. V., p. 2692, x-Q. 286). After the change was made they used a mixture of Jones oil and Yaryan pine oil (Tr., Vol. V., p. 2693, x-Q. 289). Defendant's Exhibits 35 and 36 (Tr., Vol. IX., pp. 5015-5016) give a complete statement of the mill operation before and after the adoption of the use of larger amounts of oil than 1% on the ore. Exhibit 35, which gives averages for the entire period before the adoption of 1% of oil, compared with Exhibit 36, which gives averages for the entire period after the adoption of 1% of oil, show that the extraction before the change was 97.461% and after the change was 98.161%. They show that the copper in the concentrates before the change was 39.294%, and after the change it was 28.458%.

Defendant's Exhibit 38 (Tr., Vol. IX., p. 5020) gives a record of experiments made with varying amounts of a given mixture of oil while other conditions were kept constant (Tr., Vol. V., p. 2662, *et seq.*).

At the Arthur plant of the Utah Copper Company the change from below 1% to above 1% of oil on the ore was made December 21, 1916. A tabulation of the results before and after the change is contained in Defendant's Exhibit 30 (Tr., Vol. IX., p. 4992). Before the change, an average of 3.76 pounds of oil per ton of ore was used, and after the change an average of 21.98 pounds of oil per ton was used. Before the change, the tailings averaged 0.361% of copper; after the change they averaged 0.238% of copper. Before the change, the recovery was 96.57%; after the change, it was 96.60 (Tr., Vol. V., pp. 2552, Q. 46). Both before and after the change they used mixtures containing petroleum oil as one of their ingredients.

At this plant a series of thirteen tests, which were full mill operations, were made using in all the thirteen tests a mixture which was made of 89% petroleum (smelter fuel oil and Jones oil), 10% of creosote, and 1% of Yaryan

ant's ore, still, in his opinion, the same amount of oil now being used could be used, and the same results in recoveries would be obtained—an admission which disposes of the whole matter and shows that it is merely dust injected into the mental atmosphere of the case to obscure the plain facts. Chapman said (Tr., Vol. VIII., p. 4453):

> " x-Q. 109. Now, you have explained the operations at the Butte & Superior which you saw by reference to the clayey gangue slimes you referred to. Is it your

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pine oil. In these tests the quantity of mixture used varied from 6.87 pounds to 96.46 pounds per ton of ore. As the amount of oil was increased from the lower limits, the recovery increased until 25.50 pounds of oil per ton were used. Using oil in larger quantities than 25.50 pounds per ton of ore, and up to 96.46 pounds per ton of ore, still gave excellent results (*i. e.*, 96.39% recovery) although the tailings carried a little more copper, to-wit, 0.272% (See Defendant's Exhibit 31, Tr., Vol. IX., p. 4994, and testimony, Tr., Vol. V., pp. 2562, *et seq.*).

At the mill of the Chino Copper Company the permanent change from below 1% to above 1% of oil on the ore was made December 21, 1916 (Exhibit 26, Tr., Vol. IX., p. 4987; also Tr., Vol. V., p. 2421, Q. 35), although they had for three days in November, 1916, used as much as 23.7 pounds of oil per ton of ore (Tr., Vol. V., p. 2416, Qs. 16 and 17). Before the change, they used a mixture of creosote (Barrett No. 4) and petroleum (Jones oil), and since the change they have been using the same mixture (Tr., Vol. V., p. 2422, Qs. 42-44). The tailings loss of copper averaged, before the change, 0.48%; and, after the change, 0.32%. The average recovery before the change was 95.528%; and after the change, 96.936% (Tr., Vol. V., p. 2424, Q. 50). After the change the average amount of oil used was 22.18 pounds per ton of ore (Tr., Vol. V., p. 2421, Q. 37).

At the mill of the Ray Consolidated Copper Company the change from below 1% to above 1% of oil on the ore was made the middle of January, 1917. A tabulation of the results before and after the change is contained in Defendant's Exhibit 44 (Tr., Vol. IX., p. 5033). Before the change they used a mixture of creosote (Barrett No. 4) and petroleum (fuel oil), and since the change they have been using the same mixture (Tr., Vol. VI., p. 3244, Q. 37). Before the change of quantity of oil varied from 3.22 pounds to 5.28 pounds per ton of ore. Since the change it has varied from 18.77 pounds to 21.19 pounds per ton of ore (Tr., Vol. VI., p. 3243, Q. 31). The average extraction before the change varied from 91.80% to 96.52% in different years; and since the change it has been between 94.48% and 96.19%. The average copper in the tailings before the change varied from 0.397% to 0.617% in different years; and since the change it has been between 0.368% and 0.452%. At this mill also experiments were made to determine the results of keeping the mixture of oil constant, and varying only the quantity used, which experiments showed that with the mixture now employed inferior results were obtained when a diminished quantity of oil on the ore is used (Tr., Vol. VI., p. 3253, Q. 73, *et seq.*).

opinion that it would not be possible to practice the process with as large an amount of oil if that clayey gangue slime were absent?

"A. You could practice the process if you followed out the process of the Magna mill.

"x-Q. 110. Well, suppose we simply eliminate the criticism you make of the Magna mill and carry it out just the way they did at the Butte & Superior mill. Do you think that it would be impossible without the presence of this clay gangue slime you refer to?

"A. I should think it would be quite possible to carry out the process, yes.

"x-Q. 111. With the same amount of oil?

"A. Yes, with the same amount of oil.

"x-Q. 112. And the same procedure?

"A. Yes, the same procedure.

"x-Q. 113. And in the absence of the clay gangue?

"A. In the absence of the clay gangue, yes.

"x-Q. 114. And it still would be the agitation froth process?

"A. Absolutely."

Furthermore, the suggestion or contention that there is something in defendant's ore which "soaks up oil like a sponge" is conclusively contradicted by the statement made by Mr. Williams in his opening argument, where he said (printed report Plaintiff's Oral Arguments, pp. 27, 28):

> "* * * we find that at the Timber Butte mill they have an ore which is *very nearly the same as the defendant's ore*, which is being treated with .7 of a pound of pine oil. * * * It comes pretty near to being the smallest amount that has been used."

If an ore which is "very nearly the same as defendant's ore" can be treated with "pretty near the smallest amount that has been used," it is evident that it does not have in it a constituent which "soaks up oil like a sponge."

This is confirmed by Defendant's Exhibit 158 (Tr., Vol. IX., p. 5184), which contains a report of defendant's flotation operations. This exhibit shows that during the year 1915 the average pounds per ton of oil used by defendant was 1.49 pounds, being 0.07% on the ore, and that the recovery was 90.36%, while the tailings carried 1.73% of values. These results could not

have been obtained if there had been in the ore something which "soaked the oil up like a sponge." Again, this exhibit gives the percentage of oil in the concentrates and in the tailings. If there was something in the ore which "soaks the oil up like a sponge" we would find most of the oil in the tailings, and comparatively little oil in the concentrates; whereas an examination of the exhibit will show that, when using more than 20 pounds of oil per ton of ore, the oil in the concentrates ran from 1.86 to 2.45%, while the oil in the tailings ran only from 0.55 to 0.71%. In the joint run at defendant's plant on April 29, 1917 (see Defendant's Exhibit 227, Tr., Vol. IX., p. 5294), the oil in the concentrates was 3.13%, and the oil in the tailings was only 0.35%. Nor is this a peculiarity of the results obtained when using above 1% of oil, for when only a small fraction of 1% of oil is used, the concentrates also carry most of the oil. This is shown in Prof. Chandler's table in the Hyde case (Tr., Vol. II., p. 161). That table shows that using a very small fraction of 1% of oil, the middlings and concentrates carried 87.2% of the total oil used, and the tailings carried only 12.7% of the total oil used; and this notwithstanding the fact that the quantity of the tailing was considerably more than the quantity of the middlings and concentrates.

Why Defendant and Others Use Only a Little Above 1% of Oil and Do Not Use Larger Quantities.

Counsel for plaintiffs in the court below commented on the fact that in each of the above-named mills and in defendant's mill amounts of oil only slightly above 1% were used. They said these people were very careful not to use much above 1% of oil. The inference sought to be drawn from this is that larger amounts of oil could not be used and metallurgical results obtained. No such inference is admissible. Experiments on mill scale with much larger quantities of oil are described in the record, which experiments show that, except for the matter of cost, much larger quantities might be used (Defendant's Exhibit 31, Tr., Vol. IX., p. 4994).

The witnesses explain why they abstain from using much more than 1% of oil. Thus Engleman, of the Ray

Consolidated Copper Company, said, "it has been to date practically impossible to get enough oil to continue operations daily with the use of more than 20 pounds of oil per ton on seven thousand tons of feed" (Tr., Vol. VI., p. 3257, Q. 80). Wicks, of the Chino Copper Company, says that they had "a great deal of difficulty in some instances in getting the necessary tank cars and in getting the oil delivered" (Tr., Vol. V., p. 2454, Q. 189), and he explains from the records that on certain days when the quantity of oil used was cut down because they could not get sufficient oil to run at full capacity, using more than 1% (Tr., Vol. V., p. 2495, x-Q. 405, and p. 2498, x-Q. 427). T. A. Janney, of the Utah Copper Company, explains that their slimes plant is not in operation, because they cannot get enough oil to run it (Tr., Vol. V., p. 2578, Q. 170). He also states that to run the flotation plant of the Arthur and Magna mills to their full capacity, using no more than 20 pounds per ton of ore, would require 87,500 gallons of oil per day, and that they should carry at least 60 days' supply on hand to be safe (Tr., Vol. V., p. 2578, Qs. 175, 176). Dosenbach, one of defendant's engineers, says the defendant has had great difficulty in obtaining the amount of oil required (Tr., Vol. VI., p. 3375, Q. 245 *et seq*).

The Suggestion that by Some Trick of Operation Defendant Does not Use in the Process the Amount of Oil Which it Appears to Use is not Warranted by the Record and was Ignored by the Court Below.

Chapman, a technical witness for plaintiffs, in referring to the daily run at the Magna plant of the Utah Copper Company, which he saw on Saturday, April 22, 1917, insinuated that the first box was used as a de-oiling vessel. He did not say this positively and unqualifiedly, but in a manner that was evidently intended to reflect on the honesty of the Magna operation and on its staff. He said (T. R., Vol. VIII., p. 4426):

> "Now, the overflow from the first box on the side of the machine that we were examining was very intermittent; I judge that it overflowed perhaps ten minutes in every hour. This intermittent over-

flow interested me so much that I made several visits to the *other side of the machine*, and I noticed that of the five visits that I made it was overflowing on four occasions ; and *indeed it would be quite easy, and it would be a great temptation to remove that oily float continuously in ordinary operations.*"

He does not boldly say such was the case, but that "*it ould be easy*," and that "*it would be a great temptation.*" Such stimony is not the kind to which courts of equity pay any erious attention. Strange it is, this being an *inter partes* ffair, where every courtesy was extended to these witnesses the plaintiffs' staff, that he did not call these alleged overows to the attention of the observers who were present and epresenting the Magna plant.

The witness Greininger, a former member of plaintiffs' echnical staff, was present as an observer for plaintiffs at the Magna plant on April 22d during that day's run, and said of he first spitzkasten (Tr., Vol. VIII., p. 4334) that—

"The first spitzkasten produced concentrate intermittently ; * * * the float in the first spitzkasten was very oily, largely an oil emulsion," etc.

He had, however, to acknowledge that (Tr., Vol. VIII., p. 4335, Q. 56)—

"At the time the sample was taken it was not overflowing."

This acknowledgment was due to the fact, undoubtedly, that during the taking of the samples an observer representing the plant was on hand.

Mr. Frank G. Janney, the general superintendent of all of the Utah Copper Company's mills, was called in surrebuttal and testified that he was present at the mills of the Magna plant on April 22d during the visit of the witnesses Chapman and Greininger. He said in regard to the operation of the first cell (Tr., Vol. VIII., p. 4818, Q. 16) :

"The first cell was operating as an emulsifier * * * for some time * * * since the middle of January. No concentrate was produced in that cell.

> * * * It is not the intention in our operations to produce a concentrate on that cell, and although a concentrate is formed of mineral-bearing froth, *it is not discharged.* Occasionally the froth fills up to such an extent that it discharges of its own accord, but not with our intentional operations."

Of the froth produced in the first cell under consideration, he says (Tr., Vol. VIII., p. 4820, Q. 24):

> "It is a very light aerated froth, and the fact that it lies dormant on the surface of the water, and any air that is released in the spitzkasten has to rise through that froth, the result is that we get a very light, large bubble aerated froth."

The Circulating Load and Its Effect.

In the first spitzkasten, or the "rougher cells," as they are called, there is constantly being introduced (1) new ore, (2) the circulating load composed of water, *oil* and ore, called the " middlings," and (3) *new oil.* If no new oil were introduced at this point still it is obvious that some oil would be present. To determine, therefore, the percentage of oil actually present in the rougher cells, we must take account of the oil introduced with the middlings. Hence, if we wish to have in the rougher cells 1% of oil on the total ore present, and the middlings contain just 1% of oil on the ore contained therein, we must add just 1% of oil on the new ore which is added to the rougher cells, in order to have in the cells 1% on all the ore which is present in them (*i. e.*, the ore introduced with the middlings plus the new ore). For the same reason, if we still wish to have in the rougher cells 1% of oil on the total ore present, and the middlings contain 1.5% of oil on the ore, we must add just 0.5% of oil on an amount of new ore added equal in amount to the ore introduced with the middlings. If we should add more than 0.5%, an analysis of the contents of the rougher cells would show that there was present more than 1% of oil on the total ore in the cells.

This is a matter of simple arithmetic, and is fully explained by Conrads (Tr., Vol. V., p. 2703, *et seq.*). Not one of plaintiffs' witnesses has attempted to deny this simple and self-evident

fact. Plaintiffs' brief below, however, seemed to say that their witnesses have denied it; but in fact they have not. They simply have said that in their practice of the process heretofore they have never taken the oil in the middlings into account. They do not deny, however, that they should be taken into account if one desires to know the exact percentage of oil on the ore employed in the process.* The fact is, when operating with a circulating load, plaintiffs' witnesses have actually been using in the process a little more oil than their records indicate; but since they were not concerned, as defendant now is, in keeping track of the exact percentage of oil used, and since the amount used all-told was microscopic, it was perfectly natural that they should not trouble themselves about it. Defendant now must trouble itself about exact percentages, because (1) the question of infringement turns on it, and (2) the amount of oil used now is so large that economy compels defendant not to use more than it has to.

Plaintiffs' counsel in their brief below seemed to allege that since many cells are working simultaneously in defendant's mill, some of them in parallel and others in series, all the cells, after the first or rougher cells, must be operating on a smaller percentage of oil on the ore than is contained in the rougher cells. If this is what counsel mean to allege, the allegation is not at all in accordance with the facts, as is clearly proved by the record. For simplicity we will confine our discussion to the record of the joint test on April 29. The record of that test (Defendant's Exhibit No. 227, Tr., Vol. IX., p. 5294), taken in connection with the testimony of the

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* Thus Grieninger only says (Tr., Vol. VIII., p. 4342, Q. 97) that he never considered nor took account of the oil in the circulating load as part of the oil supply; and (Q. 99) that he never looked upon it from the light or considered it from the standpoint of an oil-saving operation. Thus Chapman only says (Tr., Vol. VIII., p. 4437, Q. 45) that he has never taken it into account. Thus Wiggins only says (Tr., Vol. VIII., p. 4297, Qs. 20, 22 and 23) that he has never taken it into account in determining the consumption of oil in the process. Thus Rossbery only says (Tr., Vol. VIII., p. 4383, Qs. 103, 104) that he never returned the middlings for the purpose of saving oil.

Not one of these witnesses said, or could possibly say, that in determining the actual percentage of oil on the ore present in the rougher cells, the oil in the circulating load should not be taken into account.

witnesses (Tr., Vol. VII., pp. 3910 *et seq.*) shows the following facts: 1.77% of oil on the ore was present in the rougher cells. The concentrates from the rougher cells went through a series of cleaner cells. This concentrate contained more than 1% of oil (to-wit, an average of 2.74%); and when it was discharged as a finished product from the third and last cleaner cells, it contained a still larger percentage of oil (to-wit, 3.13%). The tailings from No. 1 cleaners contained more than 1% of oil (to-wit, 2.18%); and these were put into the circulating load and went back to the rougher cells. The tailings from No. 2 cleaners contained more than 1% of oil (to-wit, 2.24%); and these tailings were sent to waste. The tailings from No. 3 cleaners contained more that 1% (to-wit, 2.74%), and these were carried back as a circulating load to No. 2 cleaners. This completes the record of the cleaner operations, and gives a complete history of the concentrates discharged from the rougher cells. It will be seen that at all times the oil on the ore was more than 2%, and not less than 1%. The tailings from the rougher cells went to the middlings cells. From these cells the concentrates discharged contained more than 1% of oil (to-wit, 1.68%); and these were put into the circulating load and carried back to the rougher cells. The tailings from these middlings cells contained less than 1% of oil, but they were then and there shunted out of the system and discharged as waste.

The fact is, the process of the patent and the "critical proportions" of the patent have to do only with the percentage of oil on the ore in the rougher cells. The patent describes a one-cell process. Defendant's rougher cells correspond with the single cell of the patent, in which the prescribed amount of oil is to be used. After the ore has been treated in that cell, the patent says that the tailings may be subjected to any desired supplemental treatment. Thus it says (p. 2, lines 25–39) that the tailings may be treated on a shaking table or the like, and it says (p. 2, lines 103–119) that they may be treated with compressed air. These treatments are, however, mere adjuncts to the main process, and have nothing to do with that process *per se*. They are not claimed in the patent in suit. Indeed, the supplemental cleaning of the

tailings with compressed air is disclaimed, for the patent says (p. 2, line 116):

> "This idea is not claimed broadly in this case, but forms the subject-matter of an application filed by us on January 9, 1906, Serial No. 295,326."

In precisely the same sense defendant's treatment of the tailings in the middlings cells and callow cells (when used) are mere adjuncts of the main process, and have nothing to do with that process *per se*. Indeed, the concentrates produced in the middlings cells and callow cells (when used) are not taken off as a finished product, but are *returned to the circulating load and carried back to the rougher cells, to be there again subjected to treatment with something more than 1% of oil on the ore.*

The Alleged Presence of Solid Grease in the Feed at the Test on April 29th.

It was stated several times in plaintiffs' brief in the Court below that particles of solid grease were present in the feed during the test of April 29th, and that these were due to the fact that the temperature of the water was from 10° to 12° Centigrade. It is also stated that Sadtler's experiments with defendant's oil mixture, showing that solid particles of grease could not have been present in it, were conducted with water at 18° Centigrade, and therefore proved nothing. The facts are these: In the first place, it does not appear that anybody took the temperature of the water with a thermometer during the test. All that Chapman says is that the temperature (Tr., Vol. VIII., p. 4437, Q. 43) "I *should judge* to have been on that day between ten and twelve degrees Centigrade." Evidently this was mere guess-work. In the second place, Sadtler does not say that his experiments were conducted with *water* at 18° Centigrade. What he says concerning defendant's mixture of oil which he duplicated (Tr., Vol. VIII., page 4806, Q. 16) is "I made that mixture entirely in the cold, simply by stirring the ingredients together entirely in the cold, and the *temperature of the mixture* as taken by a thermometer at the time was 18° Centigrade, which

is relatively low, and *I believe* was under the temperature existing in the flotation mixture at the time of the visit on Sunday." In other words, he says the temperature of the *mixture of oils* when made was 18° Centigrade, and he *believed* that the temperature of the load during the test was above 18° Centigrade, and not between 10° and 12° Centigrade, as Chapman guessed. Both Chapman and Sadtler were guessing, and the guess of one is as good as the guess of the other. However, Sadtler gave 18° Centigrade as the temperature of the *mixture of oils* when made, and not the temperature of the *water* into which later he put the mixture. As to the temperature of the water into which he put the mixture, he said (Tr., Vol. VIII., p. 4806, Q. 16), "Then a small amount of that liquid was put into a bottle containing *cold* water and was shaken up energetically." He was not cross-examined as to the temperature of the water, and there is nothing in the record to show that he measured it with a thermometer.

Any argument based on the precise temperature of the feed at the joint test (which nobody thought worth while to determine with a thermometer) is evidently a mere catching at straws, because nobody will contend that the process in its essentials would be changed by such minute difference of temperature.

The Contaminated Oil of the 25% Kerosene Experiment.

Plaintiffs' counsel in their brief below insinuated that defendant's experiments before the District Court with 25% kerosene were dishonest. They characterized them as "spurious experiments," and they spoke of the "exposure" of the deceit. As we have avoided discussing the Kirby patents (with which these experiments had to do) because these patents were before the Supreme Court in the Hyde case, we should logically pay no attention to these insinuations here; but as they constitute an attack upon the good-faith and fair-dealing of our witnesses, we cannot in justice to our client pass them by in complete silence.

The fact is, the kerosene used in these experiments did contain a trace—a mere trace—of an oil soluble in water, which may have been, we admit, pine oil. The first important question is: Was it there by design or was it there by acci-

ent? The next important question is: Was it present in sufficient quantity to account for the successful results of these experiments?

The answer to the first question will justify the insinuations of plaintiffs' counsel, or will dispose of them once and for all.

There is no question whatever but that the soluble oil present in the kerosene was there by accident and not by design, and that its presence was not suspected by defendant's witnesses when they performed their experiments in Court. Higgins discovered the presence of this "small amount" of contaminant, but it was so small in amount that he admitted they were "not able to isolate it" (Tr., Vol. VIII., p. 4619). Later Sadtler analyzed the kerosene carefully and found it to contain *twelve one-thousandths of one per cent.* (0.012%) of something soluble in water (Tr., Vol. VIII., p. 4802, Q. 11). Previously Dosenbach had been cross-examined about this kerosene, and had stated that nothing had been added to it after it was purchased (Tr., Vol. VII., p. 3891) and that, so far as he knew, it was not "contaminated in any way with other oils" (x-Q. 155); but that (x-Q. 149)

> "Sometimes we have no tanks available and we have to use a tank that has contained other oils, but then that is very seldom. It is quite a hard problem to take care of all these different oils that come in, and it is necessary sometimes to put the kerosene, as well as other oils, into tanks that have contained different oils."

That in practice defendant cannot provide brand new tanks for each new kind of oil received, and that it must and does put oil when received into whatever empty tanks are available, without reference to what kind of oil the tank has held before, is too obvious to require testimony to prove it. What evidently happened was that the kerosene in question had been put in a tank which had previously contained another oil (possibly pine oil), which explains the presence of such an oil in a quantity which amounted to a mere trace. There is no reason whatever to doubt Dosenbach's statement that he believed the kerosene employed in the experiments was free from even a trace of other oils. This simple explanation completely disposes of the insinuations of bad faith aimed at our witnesses.

The only remaining question is whether this contaminating oil—assuming it to be pine oil—existed in the kerosene in sufficient quantity to account for the successful results of the experiments. As we have said, Sadtler found in the kerosene twelve one-thousandths of one per cent. (0.012%) of water-soluble oil. In the experiments 25% of kerosene on the ore was used. Hence the amount of pine oil (if it was pine oil) on the ore present was one-quarter of twelve one-thousandths of one per cent. It was, therefore, *three one-thousandths of one per cent.* (0.003%) on the ore—a mere trace of a trace of pine oil! Will anybody contend that 0.003% of pine oil on the ore will produce any substantial effect? We think not. At least no one has as yet advanced such a contention. Then, with what reason do the plaintiffs ask the Court to throw out of the case these experiments, especially when Sadtler was prepared to repeat them with the same kerosene oil freed from contaminant, and was prevented doing so by the strenuous objection of our adversaries (See Tr., Vol. VIII., pp. 4791 to 4801)? Our witnesses did not know that the kerosene used by them in the experiment was contaminated by a trace of another oil. When that fact was developed by the testimony of plaintiffs' witnesses, it was a complete surprise to our side; and we should have been permitted to repeat the experiments with purified kerosene, if anybody really thought that the presence of this trace of a trace of soluble oil was responsible for the successful results produced. Verily our adversaries have been reduced to the necessity of catching at mere straws and objected to having the flotation capacity of this particular straw exposed.

It is perfectly true that some kerosene oils can be found which will not produce a froth, for, as Sadtler said (Tr., Vol. VIII., p. 4790, Q. 6):

> "Some kerosenes that I have tried cannot be made to raise a froth with the flowing ore pulp. Other kerosenes do. In tests and experiments made several years ago, I tested Pennsylvania kerosene, California kerosene, Oaklahoma kerosene, and Texas kerosene, and in three cases out of four I was able to produce excellent mineral froths with kerosenes. With some of them I did not obtain any results. So I am of the opinion that

> many kerosenes, absolutely free from any foreign mixture—and I should say that one of these California oils that I mentioned, California kerosenes, I made myself in my laboratory direct from the California crude oil by distillation of the kerosene fraction, * * * so that I had a standard kerosene fraction made from California petroleum that I could vouch for as being the genuine kerosene fraction of that crude oil. That kerosene is a good frothing agent, gave me excellent mineral froths. These results were gotten in June, 1914."

This testimony was not contradicted and does not conflict th the experience of plaintiffs' witnesses, who tried samples kerosene which would not produce a froth.

Indeed, the fact that petroleum alone will answer the rposes of the process is completely established in this case. s pointed out (*supra*, p. 47), in the earliest written descripon of the process the patentees themselves stated that petroleum residuum" (the heavier fractions after the kerone has been distilled off) and "paraffine oil" (kerosene) are nong the oils which may be used as a substitute for oleic id.

II.

The effect of the evidence presented in this ase which was not before the Supreme Court in he Hyde case.

The next question to be answered is: Is the evidence prented in this case—evidence not before the Supreme Court in he Hyde case—of such character as, in the opinion of this ourt, would have led the Supreme Court to reach a different onclusion if it had been presented in the Hyde case?

Considerable testimony has been taken in this case conerning the philosophy of froth concentration, in an effort by earned scientists to explain the whys and wherefores of the rocess. While this testimony is interesting and instructive, t is not necessary for this Court to consider it, because whatver may be the laws and manifestations of laws involved (a subject on which the scientific experts are not in complete agreement), the construction of the patent has been finally

determined by the Supreme Court. It is the law of the land respecting the patent in suit.

The Supreme Court's decision declaring valid claims 1, 2, 3, 5, 6, 7 and 12 was, we think, based on two alleged facts which were urged in argument, and which were apparently established by the proofs in the Hyde case. These were :

(a) While it is possible in the laboratory with prior-art quantities of oil and agitation to obtain highly useful metallurgical results using more than 1% of oil, yet such results cannot be duplicated in mill operations.

(b) There is a " divide " which separates the territory of the prior art from the territory of the patented process, and that " divide " is determined by the quantity of oil used, to-wit, a small fraction of 1% on the ore.

Both of these alleged facts, claimed by the plaintiffs to be established by the proofs in the Hyde case—facts on which we think the decision of the Supreme Court in that case was fundamentally based—are abundantly proved to be fictions by the evidence in this case.

(a)

Are we justified in saying that in the Hyde case it was urged in argument, and claimed to be established by the proofs, that while it is possible in the laboratory with prior-art quantities of oil and agitation to obtain highly useful metallurgical results, such results cannot be duplicated in mill operations ?

What Mr. Kenyon said in argument before the Supreme Court on this point was (printed report of arguments before the Supreme Court, p. 85) :

> " Mr. Justice Pitney : What have you to say in answer to what Mr. Scott said the other day to the effect that 1.8 per cent., or perhaps more, of oil, would give the same result with increased agitation ?
>
> " Mr. Williams : Absolutely no.
>
> " Mr. Kenyon : It would not.
>
> " Mr. Justice Pitney : I understood him to say so yesterday, and I supposed there was something in the record to justify it.

" Mr. Kenyon: Nothing. That will be a part of my argument.

* * * * * *

" Now as to the allegation that agitation will achieve the end with any amount of oil, it simply is not so.

* * * * * *

" If a larger quantity of oil be added to the pulp, for example, two or three per cent., the Cattermole effect appears. With the same identical agitation, the oiled metal particles agglutinate and sink. The values are taken away at the bottom. This larger quantity of oil on the metal particle destroys the attraction of those particles for air cells, as evidenced by the fact that air is beaten into the pulp in the Cattermole agitation just the same as in the identical agitation in the process in suit, but it does nothing and escapes and, in spite of it, the values go to the bottom.

" Mr. Justice Holmes: That is the formation of globules?

" Mr. Kenyon: The formation of globules. It utilizes the stickiness of oil.

" If still more oil than Cattermole proportions be added to the pulp, too much to act as an agglutinant, the same agitation will beat it up into a pasty magma or oil emulsion, no matter what the quantity of oil, entrapping air cells and metal particles, but having little affinity for either and destroying their affinity for each other.

* * * * * *

" These oil magmas or froths with any amount of oil can be *readily produced in the laboratory.* But they are mere laboratory freaks, *absolutely useless in the mill.* In the mill granules would tend to form and go to the bottom. The froth would be fragile and drop in great chunks. It would not hold onto the metal. It would be unreliable and uncontrollable.

" As to the proposed demonstration to-morrow, it was our purpose simply to illustrate our process and let you see this intermediate product of our process, the froth, and the Cattermole metal-sinking process, but the respondent is concerned to prove by what he will show to-morrow alleged identity of froths by visual observation, therefore I must forewarn you.

" If the respondent tomorrow repeats the tests set out in his record, he will be doing what is nowhere shown in any part of the prior art, as our brief points out in detail.

" Mr. Justice Pitney: He will be doing what?

"MR. KENYON: He will not be carrying out the processes of the prior art.

"MR. JUSTICE PITNEY: What will he be doing?

"MR. KENYON: He will be performing tests with large quantities of oil, just laboratory tests that he arbitrarily chooses to perform. He will give them the names of old processes; he will call them Everson, Kirby, Froment, but they will not be either of those three.

"1. They will be carried on in modern machinery not known at the time.

"MR. JUSTICE MCKENNA: Pardon me one question. Will they be using more than *one-half of one per cent.* of oil?

"MR. KENYON: Yes, sir; anywhere up to 25 per cent.

"MR. JUSTICE MCKENNA: Yet they result in the production of a froth?

"MR. KENYON: You will have an oily mass or magma at the top, but it will *not do anything towards concentration of ores.* I am coming right to that point now.

* * * * * * *

"MR. JUSTICE MCKENNA: *Your contention then is that the laboratory test is no standard.*

"MR. KENYON: *Yes, sir; absolutely no standard whatever.*

"MR. JUSTICE MCKENNA: *Do you admit that the laboratory tests show a similarity?*

"MR. KENYON: *Yes. I cannot myself tell one float from another by visual observation. But the mill man will tell you the instant he tries to carry out the process in the mill.*

"Indeed even minute departures in the mill from the standard oil quantity needed for the particular ore are harmful, and I want your Honors to mark page 196 of our brief on that point.

"Mr. Chapman was asked:

> "'What has been your experience when, in using the agitation-froth process on a commercial scale, with a normal and proper consumption of one and a half pounds of oil per ton of ore, this procedure has been varied by increasing the oil feed to 2½ pounds per ton of ore?'

"NOTE: This was only a small increase. He says the tailings, on examination, immediately showed increased losses of sulfide mineral. The result was harmful.

* * * * * * *

"MR. JUSTICE MCKENNA: *Are there any experiments on the other side showing more than laboratory tests?*

"MR. KENYON: *No, sir. They stop with laboratory tests. To-morrow you will see, but you will not know. The layman cannot tell the useful froth of the process in suit from a useless oil emulsion; whether it is a step in a real process of ore concentration or only a sham; whether it can be reproduced in the mill or not, or would treat or successfully concentrate ore. It is a situation for caution, especially as the court below was misled by just such demonstrations*" (pp. 85–90).

Mr. Kenyon supported his statement by reference to the record as follows (printed report of arguments before the Supreme Court, p. 88):

"Finally, such oil froth processes are *absolutely not usable in the mill at all.* To demonstrate that I want to turn to the evidence of Dr. Byrnes, for the defendant. I presume this will be one of the tests that will be shown you to-morrow. I do not know what it will be called to-morrow. Record, page 108, Second Experiment Froment. 3.6 per cent. of cotton seed oil agitated in our slide machine, about two pounds of the ore treated. Result: his tailings showed only one per cent. of zinc—wonderfully clean tailings; his recovery, as figured by Dr. Liebmann (page 299) was about 100 per cent. of the values—a remarkable recovery.

"We followed identically that same process first in a seven-ton a day plant, a semi-commercial plant, and then in a fifty-ton a day plant, a full commercial plant—to see what would happen. We did just the things there that Dr. Byrnes did in the laboratory. Mr. Higgins testifies as to the first at page 387 of the record. Result: his tailings showed 12 per cent. zinc, and his recovery was only 50 per cent. of the values. Half of the values were gone. He says the float fell in masses; that the tailings had some granules (the Cattermole effect had been to some extent produced); that the recovery was not satisfactory.

"Chapman testifies as to the test in the fifty-ton plant (pp. 388-391). 1,680 pounds of ore were run through in each of the four tests. In the first test the tailings showed 17 per cent. of zinc. Seven-eighths of the original zinc in the ore was in the tailings. He then added more acid, to favor the process. 14 per cent. of the tailings were zinc. Seven-tenths of the values went away in the tailings. He then diminished the duration of the agitation, to favor it, and 17.5 per cent. of the tailings were zinc. Four-fifths

of the values run away with the tailings. He says these processes were absolute failures as to results (page 390 of the record). Then he cut the oil in two, using 1.8 per cent. of cotton-seed oil. His tailings were 13 per cent. oil. The recovery was 69 per cent. But he says of it that the 'result' was of 'no commercial value at all' (Record, page 391)—that there was '*really no concentration at all*" (Record, page 392)—that the *concentrate was practically of no more value in proportion of metal afterwards than before.*"

Mr. Williams, in his argument (pp. 33), said:

> " So we had Mr. Higgins carry out the same operation, practically the same, with 3.6 per cent. of oil in a little testing plant which was available at the mines of Senator Clarke in Butte, Montana. It was only a little plant. It was not a full size operation. In that operation he lost 50 per cent. of his metal. He said that it fell down in bunches when it spread out on the surface of the spitzkasten, and although at a little distance it looked like our floating froth, on close inspection it was found to be an oily floating mass. It fell down in bunches, and it only saved 50 per cent. of the zinc and threw away the rest of it. But we were not satisfied with that. We took the smallest full-size plant, the 50-ton plant, through which 50 tons of ore are carried by 200 tons of water in twenty-four hours, and we carried out an operation in that, and there the loss was 82 per cent. It was hopeless. *So that we demonstrated the negative of the proposition that the defendant had failed to demonstrate. We demonstrated that these products of the legerdemain of the laboratory, not prior art at all, were worthless in the concentration of ores, wholly regardless of the question of the cost of oil or anything else.*"

On behalf of the defendant in the Hyde case there was no testimony whatever contradicting these proofs. Indeed, it was not possible at the time the proofs were taken in that case to produce such testimony, because it was not until the spring of 1913 that the defendant became convinced that flotation would be a success in mill operations, and adopted it (Tr. VI., p. 3528, x-Qs. 53, 54), while the testimony in the Hyde case was closed before the beginning of the year 1913.

So, in the Hyde case, the proofs were all to the effect that quantity of oil above a small fraction of 1%, while apparently capable of yielding useful metallurgical results in the laboratory, was incapable of yielding similar results in mill operations.

In this case the converse of that proposition is abundantly established.

For example, Defendant's Exhibit 31 (Tr., Vol. IX., p. 994) gives the results of a series of mill operations at the Arthur plant of the Utah Copper Company in which different quantities of the same oils were used. In the first series (Nos. to 13) the same oil mixture was used varying in amount from 6.87 pounds per ton to 96.46 pounds per ton (*i. e.*, from about 0.33% to 5%). An extraction of 96.39% was obtained with the use of 5% of oil. While a higher extraction (98.41%) was obtained with the use of less oil (25.50 pounds per ton) yet the difference is clearly one of degree and not of kind.

The continuous daily practice since December, 1916, not only of the defendant, but of the Utah Copper Company at its Magna and Arthur plants, the Chino Copper Company, and the Ray Consolidated Company in the use of oil in quantities greater than 1% on the ore, conclusively establishes the fact that the use of oil in quantities larger than 1% produces useful metallurgical results not only in the laboratory but also in the mill.

(b)

Are we justified in saying that it was alleged in argument, and apparently established in the proofs in the Hyde case, that there is a "divide" which separates the territory of the prior art from the territory of the frothing process, and that such "divide" is determined by the quantity of oil used, to-wit, a small fraction of 1%?

The testimony in the Hyde case on this point has heretofore been set forth in this brief (*supra*, pp. 11–16). It only remains, therefore, to state what Mr. Kenyon said on this point in his argument before the Supreme Court (printed report of argument before the Supreme Court, p. 91):

> "Now, the very best possible argument of invention is found right on page 448 and page 451 of the record

['*i. e., pp.* 1108 to 1112 *of the Transcript in this case*'] —the story of the birth of the invention. Because as the quantity of oil was diminished (see column three of 'Details of Experiments,' p. 448, '*i. e., p. 1109 of the Transcript in this case*')—as the quantity of oil was diminished the Cattermole granulation became worse and worse. That was degree. *But there came a time when you got over the divide, and something else happened. Just the contrary happened.* As you then from that point went on diminishing the oil that new result increased. That was not degree. *You had gone over the divide. You were in a new country.*

"It is apparent now that the inventors in their *minute one-tenth of one per cent.* oil frothing reagent were really invoking a characteristic and a power of oil in an ore concentration process that develops *only in that relatively microscopic quantity*, and which is defeated and disappears when that *minute quantity is even slightly exceeded*, a characteristic and a power of oil which had not existed in the prior oil concentration processes of the art, which had never been utilized by anybody for ore concentration, and the very existence of which had not been known or suspected. They were invoking the power of oil when present in *microscopic amount* to exercise the powers of the air to search out and find in the swirling vortex of the pulp, and hold on to through the seven or eight minutes of agitation, and safely bring to the top at the end, the valuable mineral particles and hold on to them there until they could be floated away. They harnessed the giant of the air to their task, and the oil was only curb and bit. It was a wholly new role for oil to play, a wholly new function for oil to perform, a wholly new combination of oil and air. That takes this process right out of the oil concentration art. It is not a process of oil concentration. It is a process of air concentration, as both the House of Lords and the Privy Council have held."

In this connection we also refer this court to the colloquy between Mr. Justice McReynolds and Mr. Kenyon, quoted *supra* (p. 17).

In the present case the court hears nothing about the "divide," or about the "critical" and "microscopic" quantities of oil which alone will do useful work; for here it is admitted that prior-art quantities of oil will do useful work, and it is sought to make the patent cover such quantities—any quantity, in fact, which will do useful work.

If plaintiffs' present contentions had been presented to the Supreme Court, who will say that court would have found the patent valid? It was found valid on the understanding that only critical and microscopic quantities would do useful work in the mill, and it was sustained only as limited to such critical and microscopic quantities.

III.

Plaintiffs have no right to maintain this suit because they have "unreasonably neglected or delayed to enter a disclaimer".

Our contentions with respect to the so-called disclaimer are:

(a) If the so-called disclaimer had its intended effect of broadening claims 9, 10 and 11, it is not a disclaimer in fact, and is a nullity.

(b) If the so-called disclaimer has not changed the scope of claims 9, 10 and 11, it is not a disclaimer in fact, and is a nullity.

(c) In either of the above cases, since plaintiffs' right to maintain this suit is derived solely from the remedial and enabling disclaimer sections of the statutes, which require the filing of a disclaimer *without unreasonable delay*, the plaintiffs now have no right to maintain this suit.

At common law a patent which was bad in part was bad in whole; a patent containing one invalid claim was wholly void (*Silsby vs. Foote*, 20 How., 378, 380; *Walker on Patents*, Sec. 203). Indeed, such is the rule in England to-day (*Frost Patent Law and Practice*, Vol. I., p. 251).

Speaking of Sections 4917 and 4922, the Supreme Court, in *Hailes vs. Albany Stove Company*, 123 U. S., 582, speaking by Mr. Justice Bradley, said (p. 589):

> "They are parts of one law, having one general purpose, and that purpose is to obviate the inconvenience and hardship of the common law, which made a patent *wholly void* if any part of the invention was wrongfully claimed by the patentee, and which made such a defect in a patent an *effectual bar* to a suit brought upon it."

At common law a patentee had the right, if his patent was defective, and the defect arose through inadvertence, accident or mistake, to *surrender* the grant and obtain an amended grant for the unexpired portion of its term. This common-law right was affirmed as early as 1832 by the Supreme Court in *Grant vs. Raymond*, 6 Pet., 218.

Shortly thereafter and in the same year (1832), Congress enacted a statute to regulate the grant of reissued patents, which, without material change, appears now as Section 4916, R. S. (*Walker on Patents*, Sec. 211).

While the reissue statute permitted a patentee to *surrender* an invalid patent and obtain a reissue *(by which act he forfeited all rights to past damages and profits)*, it did not change the common-law rule that a patent bad in part was bad in whole, and that an invalid patent could be amended only by surrender and reissue. In order to mitigate the hardship of that rule, the disclaimer statutes were enacted in 1837, which, without material change, appear to-day as Sections 4917 and 4922, R. S., which read as follows :

> " SEC. 4917. Whenever, through inadvertence, accident or mistake, and without any fraudulent or deceptive intention, a patentee has claimed *more* than that of which he was the original or first inventor or discoverer, his patent shall be valid for all that part which is truly and justly his own, provided the same is a material or substantial part of the thing patented ; and any such patentee, his heirs or assigns, whether of the whole or any sectional interest therein, may, on payment of the fee required by law, make disclaimer of such parts of the thing patented as he shall *not choose to claim or to hold by virtue of the patent* or assignment, stating therein the extent of his interest in such patent. Such disclaimer shall be in writing, attested by one or more witnesses, and recorded in the Patent Office ; and it shall thereafter be considered as part of the original specification to the extent of the interest possessed by the complainant and by those claiming under him after the record thereof. But no such disclaimer shall affect any action pending at the time of its being filed, except so far as may relate to the question of unreasonable neglect or delay in filing it."
>
> " SEC. 4922. Whenever, through inadvertence, accident or mistake, and without any willful default, or intent to defraud or mislead the public, a patentee has,

in his specification, claimed to be the original and first inventor or discoverer of any material or substantial part of the thing patented, of which he was *not* the original and first inventor or discoverer, every such patentee, his executors, administrators and assigns, whether of the whole or any sectional interest in the patent, may maintain a suit at law or in equity, for the infringement of any part thereof, which was *bona fide* his own, if it is a material and substantial part of the thing patented, and definitely distinguishable from the parts claimed without right, notwithstanding the specifications may embrace *more* than that of which the patentee was the first inventor or discoverer. But in every such case in which a judgment or decree shall be rendered for the plaintiff, no costs shall be recovered unless the proper disclaimer has been entered at the Patent Office before the commencement of the suit. *But no patentee shall be entitled to the benefits of this section if he has unreasonably neglected or delayed to enter a disclaimer.*"

In substance, Section 4917 provides that in case of an overclaim, a patentee, *without surrendering his patent* (and thereby extinguishing all claims for past infringements), may cure the defect by filing a disclaimer in the Patent Office ; and Section 4922 provides that a patentee may maintain a suit on his patent while it contains an overclaim, providing, however, " *no patentee shall be entitled to the benefit of this section if he has unreasonably neglected or delayed to enter a disclaimer.*"

It follows, therefore, that if a patent contains an overclaim, and the patentee unreasonably neglects or delays to cure it by disclaimer, he loses all right of action under the patent.

The District Court of Delaware in the Miami case as early as September, 1916, decided that claim 9 (claims 10 and 11 not being in issue in that case) was broader than the patentee's actual invention. According to some authorities, it thereupon became incumbent on the plaintiffs to promptly file a disclaimer if they would preserve their right of action on the valid claims. The fallacy of this rule, however, was pointed out by the Circuit Court of Appeals for the Second Circuit in *Page vs. Dow-Jones*, 168 Fed., 703. As the Court there said, clearly a patentee has the right to wait until the Court of last resort has determined the existence of the overclaim, before he is called upon to file a disclaimer. In other

words, it was not unreasonable for the plaintiffs to delay filing a disclaimer until the Court of last resort had finally determined the fact of the existence of an overclaim.*

In December, 1916, the Supreme Court handed down its decision in the Hyde case, and by that decision it was authoritatively and finally determined that the patent in suit contained an overclaim, in that claims 9, 10 and 11 were broader than the patentees' actual invention. After that decision was handed down, it was incumbent on the plaintiffs to file without unreasonable delay a disclaimer which would cut out this overclaim if they wished to maintain their right to sue on the valid claims of the patent (*O'Reilly vs. Morse*, 15 How., 62, 120; *Seymour vs. McCormick*, 19 How., 96; *Gage vs. Herring*, 107 U. S., 646).

While the plaintiffs did, thereafter, file a paper in the Patent Office which they called a "disclaimer", we contend that that paper was not intended to cut out the condemned overclaim, and did not, in fact, cut out the condemned overclaim. We contend that, therefore, no disclaimer in contemplation of Sections 4917 and 4922 has been filed and, for this reason, that plaintiffs have no right to maintain this suit, because the patent still contains the condemned overclaim.

The so-called disclaimer filed in the Patent Office by the plaintiffs, in its material part, reads as follows (Tr., Vol. I., p. cxxxiii):

> "Your petitioner * * * does hereby disclaim from claims 9, 10, and 11 of said Letters Patent No. 835,120, any process of concentrating powdered ores excepting where the *results obtained are the results obtained* by the use of oil in a quantity amounting to a fraction of one per cent. on the ore."

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* The question as to when the period of "unreasonable delay" begins to run was raised as early as 1857 in the case of *Silsby vs. Foote*, 20 Howard, 378. Justices Grier and Daniel in a dissenting opinion expressed the view that the period begins to run when a claim is declared invalid by a Circuit Court (p. 388); but by the prevailing opinion it was held that the period does not begin to run until the Supreme Court has passed upon the validity of the claim (p. 386). *That the period begins to run when the Supreme Court has declared a claim invalid has never been questioned, and, indeed, is not open to question.*

(a) What was the intended effect of the so-called disclaimer ?

To ascertain its intended effect we must go to the statements made by plaintiffs' connsel.

Plaintiffs' counsel stated in their oral arguments and in their brief in the Court below, that the purpose of the disclaimer was, in effect, to erase from claims 9, 10 and 11 all limitations as to the quantity of oil used, provided only the desired result was obtained.

In other words, whereas the patentees should have filed a disclaimer erasing the invalid claims, or limiting them, as the valid claims were limited, to the use of a fraction of 1% of oil on the ore (in which case the invalid claims as limited by the disclaimer would not differ materially from the valid claims), what they actually attempted to do was to broaden claims 9, 10 and 11 to cover the use of any quantity of oil, however large, which would accomplish the desired result.

Thus, in the oral argument before the Court below, Mr. Kenyon said, in answer to a question by the Court (p. 61*) :

> " The Court : The patent here in suit has been rather narrowly construed ?
>
> " Mr. Kenyon : On the contrary I think the Supreme Court has construed this patent *broadly* as for the process if and whenever the *results obtained are those that are obtained* when you effectively use this small quantity of oil."

Further he said (p. 64) :

> " In one sense this is a construction of the patent, a holding that the patent cannot be extended beyond that line. That is to say, the patent cannot be extended, under the Supreme Court holding, to the case of a process that *does not obtain the results there specified ;* but it is, by the same token, a holding that the patent should be extended up to that point. It is equivalent to laying down a rule for determining any question of infringement of this patent (assuming oil and aeration, agitation and pulp), that the *results obtained* shall be the guiding test of infringement."

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*The pages referred to here and following are those of the printed book entitled " Plaintiffs' Oral Arguments."

Further, he said (p. 82) :

> " First, as to the Supreme Court decision, for that is the most important thing in this whole litigation, and the meaning of that decision, for it is compelling upon this Court, whatever it may mean. Your Honor asked me if it was not a narrowing decision in a sense. In a sense it is a narrowing decision, and that feature of it, I think, strikes one on the first reading—on the first two or three readings—perhaps more prominently than anything else. But, studying and analyzing it, I believe it is essentially a *broadening* decision, and an *unusual and extraordinarily broadening* decision, and from that point of view I want to ask your Honor to study it a little with me."

Further, he said (p. 90) :

> " Now, why did the Court uphold claims 1, 2, 3, 5, 6, 7 and 12 as valid, and hold claims 9, 10 and 11 invalid? Why, in my judgment, just because the Court felt that claims 9, 10 and 11 were broad enough in their language to cover this oil-lift of the prior art, and the oil-float or magma that it had distinguished as old; just because the Court felt that those three claims, 9, 10 and 11, were not, as the others were, limited to the results obtained by the air-lift and in the air-froth. By our disclaimer we have disclaimed every procedure that might by any possibility have been included within those claims except the procedure recited in them when the result obtained by it is the new result defined by the Supreme Court, thereby aligning those claims with what the Court has said our patent must be confined to, with what the Court thereby says our patent may and should cover. Not results *per se;* no, that is not what the Supreme Court has said our patent is for ; if it had so said, that would be the law of the land and of this patent and of this case. But it has not so said. Not results irrespective of process, but the process, the procedure, recited in those claims when and as limited to, and *recognized and determined by, those results.*"

Further he said (p. 91) :

> " Now, that, I maintain, is a broad and fundamental decision ; a broad and an unusually *broadening* decision,

and it gives to this patent a scope as broad as the *oil-modified air-lift*, and the *metal-carrying air-froth* specified (when you have ore, water, oil and agitation), as contrasted with the *oil-lift* and the *metal-carrying oil-float* of the prior art."

Further he said (p. 92):

"So I submit that the Supreme Court decision is a guide, and a guide clear and definite and *broadening*, and that this court must apply to this patent the full measure of the definition of the Supreme Court; not, says the Supreme Court, to include an oil-lift and an oil-float, but to include every instance, it says in effect, of an air-lift and an air-froth *such as is obtained* when in the vital air-bubble metal-particle combination you have oil present in a fraction of one per cent. on the ore."

Further he said (p. 93):

"The Supreme Court has limited the patent to an air-lift and an air-froth, and to the *sort of* an air-lift and air-froth that is produced when a fraction of one per cent. of active oil is added in the way and with the agitation specified. It has read 'air-froth' into every claim, instead of 'froth,' by cutting out oil-froth, and it has read into every claim the lifting by air as contrasted with the lifting by oil; and the disclaimer so limits claims 9, 10 and 11, and it is as if, for example, claim 9 read: 'The process of concentrating powdered ores which consists in separating the mineral from the gangue by coating the mineral with oil in water containing a small quantity of oil, agitating the mixture to form a froth, and separating the froth, when the *results obtained are substantially those that are obtained by the same procedure* when the oil effectively used is a fraction of one per cent. on the ore.' THAT IS THE LEGAL EFFECT OF THAT DISCLAIMER."

Plaintiffs' counsel in their brief before the Court below explained why they did not disclaim the invalid claims. They said (p. 55):

"The Supreme Court did not, as courts often do, direct the filing of a disclaimer. The burden was

> cast upon parties and counsel of deciding al the momentous questions involved. Had the patentees wholly disclaimed claims 9, 10 and 11, an infringer might triumphantly assert that *all claim to any process employing one per cent. or more of oil had been abandoned by the affirmative act of the patentees, and that therefore the patentees were forever estopped from asserting that a process substantially the same as theirs and producing the same result by the same mode of operation, but using one per cent. or more of oil, was within their patent.*"

After quoting that part of Mr. Kenyon's oral argument above quoted, in which he paraphrases claim 9, as modified by the disclaimer, they said (p. 58) :

> " So far as claim 9 is concerned, no distinction need be made between effective oil and inert oil. The identification by the *new result* associated with the words ' a small quantity of oil ' *obviates any oil-quantity measurement as to the amount of oil used.*"

What this means in plain English is, that any quantity of oil above 1% on the ore, no matter how large it may be, is now the " small quantity " of claims 9, 10 and 11, so long as it does the work—which is only another way of saying that the limitation to a " small quantity " of oil was intended to be, and if plaintiffs' counsel are right, has been completely erased from claims 9, 10 and 11 by the disclaimer.

So we see that these claims, which the Supreme Court said were too broad because they included the use of any " small quantity " of oil, have not by the disclaimer been limited to the use of a smaller quantity of oil, but have been broadened (if plaintiffs have accomplished their purpose) so that they are not now limited at all as to the *quantity of oil used* but only to the *results obtained.*

The trick of the disclaimer consists in artfully repeating certain words taken from the Supreme Court opinion in such a way as to give them an entirely different meaning. The Supreme Court said (242 U. S., 271) :

> " The patent must be confined to the results obtained by the use of oil within the proportions often described in the testimony and in the claims of the patent as ' critical proportions '."

This language seems to be perfectly clear and entirely free from ambiguity. It says plainly that the patentees are not entitled to monopolize the results obtained by the use of oil in larger quantities—that the use of oil in larger quantities cannot be covered by this patent.

The disclaimer, however, instead of saying that claims 9, 10 and 11 are limited to the "*results obtained by the use of*" the so-called critical proportions of oil, say they are limited to a process in which the "*results obtained are the results obtained by the use of*" the so-called critical proportions of oil. By repeating the words "results obtained" in this way, their purpose was to expand the claims to cover any process using oil in which the results obtained were *like those* obtained by using the critical proportions of oil. The trick is clever, but it is transparent. The Supreme Court said the claims must be limited to the "results obtained by the use of" the critical proportions. The disclaimer says they are limited to "results obtained" *which are like those obtained* "by the use of" the critical proportions.

Assuming, for the sake of argument, that the Supreme Court decision was a "broadening" decision (which, of course it was not), yet the only way in which advantage could be taken of it is by means of a *surrender* and *reissue* of the patent —that is, by a proceeding under Section 4916. The disclaimer sections are strictly limited to cases in which (Sec. 4917) "the patentee has claimed *more* than that of which he was the original or first inventor or discoverer," and (Sec. 4922) has "claimed to be the original and first inventor or discoverer of any material or substantial part of the thing patented, of which he was *not* the original and first inventor or discoverer," and the only act on the part of the patentee justified by these sections is that he may (Sec. 4917) "make disclaimer of such parts of the thing patented as he shall *not choose to claim or to hold by virtue of the patent.*" * A disclaimer

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* Nothing is better settled than that there is no warrant in law for *broadening* a patent by disclaimer, and no warrant in law for converting by disclaimer a claim for one thing into a claim for a *different* thing.

In *Union Metallic Cartridge Co. vs. U. S. Cartridge Co.*, 112 U. S., 624, the Supreme Court, speaking by Mr. Justice BLATCHFORD, said (642):

> "A disclaimer can be made only when something has been claimed of which the patentee was not the original or first inventor,

which seeks to broaden a patent is, therefore, without warrant of law, and is a nullity.

(b) Having ascertained the intended effect of the so-called disclaimer, and having shown that if the intended effect was accomplished the so-called disclaimer is a nullity, we shall now proceed to ascertain what is the actual effect of the so-called disclaimer.

We contend that the so-called disclaimer did not disclaim anything, but leaves the claims in precisely the same condition they were before the paper was filed, and that it is, therefore, a nullity.

> and when it is intended to limit a claim in respect to the thing so not originally or first invented. It is true that, in so disclaiming or limiting a claim, descriptive matter on which the disclaimed claim is based, may, as incidental, be erased, in aid of, or as ancillary to, the disclaimer. But the Statute expressly limits a disclaimer to a rejection of something before claimed as new, or as invented, when it was not new or invented, and which the patentee or his assignee no longer chooses to claim or hold."

In *Carnegie Steel Co. vs. Cambria Iron Co.*, 185 U. S., 403, the Supreme Court, in approving a disclaimer, speaking by Mr. Justice BROWN said (436):

> "Had the purpose of the disclaimer been to reform or alter the description of the invention, or convert the claim from one thing into something else, it might have been objectionable, as patents can only be amended for mistakes of this kind by a reissue."

In *White vs. Gleason Mfg. Co.*, 17 Fed., 159, Judge WHEELER, condemning a disclaimer, said :

> "The disclaimer could add nothing to the patent. It could take away from what was deseribed as the invention and claimed as such, so as to be covered by the grant of the patent, but it had no office to make the patent cover anything, however clearly shown in the patent, not so described and claimed as a part of the invention. * * * Such changes appertain to reissues and not to disclaimers."

See, also, *Hailes vs. Albany Stove Co.*, 123 U. S., 582, 587 ; *Albany Steam Trap Co. vs. Worthington*, 79 Fed., 966, 969 ; *Westinghouse Air Brake Co. vs. New York Air Brake Co.*, 139 Fed., 265 ; *Bracewell vs. Passaic Print Works*, 107 Fed., 467, 469.

It is, therefore, a perfectly well-settled principle of law that the only function of a disclaimer is to limit a patent. A disclaimer which attempts to broaden a patent, or which attempts to change a claim for one thing (as the use of a "small quantity" of oil in the production of a froth), into a claim for a different thing (as the production of a froth by the use of *any quantity* of oil), is a nullity.

To simplify our argument, we will limit it to a discussion of claims 1 and 9 as typical, respectively, of the claims sustained and of the claims condemned.

These claims read as follows:

Sustained by Supreme Court.	*Condemned by Supreme Court.*
1. The h e r e i n-described process of concentrating ores which consist in mixing the powdered ore with water, adding a small proportion of an oily liquid having a preferential affinity for metalliferous matter (*amounting to a fraction of one per cent. on the ore*), *agitating the mixture until the oil-coated m i n e r a l matter forms into a froth*, and *separating the froth* from the remainder by flotation.	9. The process of concentrating powdered ores which consists in separating t h e mineral from the gangue by coating the mineral with oil in water containing a *small quantity* of oil, *agitating the mixture to form a froth*, and *separating the froth.*

Before disclaimer, claim 9, as well as claim 1, was limited to the production of the "froth" described in the specifications. Thus claim 1 calls for "agitating the mixture until the oil-coated mineral matter forms into a *froth*, and separating the *froth* from the remainder by flotation," while claim 9 calls for "agitating the mixture to form a *froth*, and separating the *froth*." However, plaintiffs' counsel say (*supra*, p. 77) that the purpose of the disclaimer was to limit claim 9 to the production of such a "froth." But claim 9 was already limited to such "froth" in terms; so the disclaimer did not, in fact, change the meaning of the claim at all.

That claim 9 before disclaimer was limited to the production of the "froth" described in the specifications must necessarily be true, unless the word "froth" in claim 9 is given a different meaning from the same word in claim 1—a construction which no one will seriously contend for.

The above consideration exposes the fallacy of our adversaries' contention that the Supreme Court decision is a broadening decision. The Supreme Court condemned claim 9, which was limited in terms to the "froth" of the patent, because it was not limited to the designated *critical quantity of oil* to which the sustained claims were limited. It did not

condemn claim 9 because it was not limited to the production of the " froth " of the patent, because it was, in fact, limited to such froth in terms, precisely as were the sustained claims. In other words, claims 1 and 9 were alike in that they both were limited to the production of the " froth " of the patent, and were unlike in that claim 1 was limited in terms to the prescribed *critical quantity of oil*, while claim 9 was not so limited. Yet complainants' counsel gravely contend that the Supreme Court's decision means that the vice of claim 9 was not in the respect in which it *differed* from claim 1, but was in respect to that feature in which it was *identical* with claim 1. We submit that no amount of ingenuity can spell anything so illogical out of the language of the Supreme Court.

The statement was made in oral argument by plaintiffs' counsel below that the Supreme Court condemned claims 9, 10 and 11 because the term " a small quantity " of oil which they contain is *indefinite*. The Supreme Court did not condemn these claims on such technical grounds. It condemned them because the claims were *too broad*, as clearly appears from the language of the opinion, where it says (242 U. S., 271) :

> " While we thus find in favor of the validity of the patent, we cannot agree with the District Court in regarding it valid as to all of the claims in suit. As we have pointed out in this opinion, there were many investigators at work in this field to which the process in suit relates when the patentees came into it, and it was while engaged in study of prior kindred processes that their discovery was made. While the evidence in the case makes it clear that they discovered the final step which converted experiment into solution, ' turned failure into success ' (*The Barbed Wire Patent*, 143 U. S., 275), yet the investigations preceding were so informing that this final step was not a long one, and the patent must be confined to the results obtained by the use of oil within the proportions often described in the testimony and in the claims of the patent as ' critical proportions,' ' amounting to a fraction of one per cent. on the ore,' and therefore the decree of this court will be that the patent is valid as to claims No. 1, 2, 3, 5, 6, 7, and 12, and that the defendant infringed these claims, but that it is invalid as to claims 9, 10, 11. Claims No. 4, 8 and 13 were not considered in the decrees of the two lower courts and are not in issue in this proceeding."

Claims 9, 10 and 11 were therefore condemned, not because they were *indefinite*, but because the use of a "small quantity" of oil WAS OLD.

So the Supreme Court has said, as plainly as words can say it, that it condemned claims 9, 10 and 11 because they were not limited, as the other claims were, to the "critical proportions" of oil. The plaintiffs, instead of correcting this over-claim by disclaimer, as they were bound to do if they desired to maintain their right of action under the patent, left the over-claim standing, and pretended to limit the condemned claims by inserting a feature which was always in them—not by implication, but in terms.

The result is, as we have said, the condemned claims are not changed one iota by the disclaimer. The so-called disclaimer is a disclaimer in form only, and not in substance. It is a nullity.

(c) We have shown that the plaintiffs' right to maintain this suit, if they have any such right, is derived from the provisions of Sec. 4922 R. S., and from no other source. We have shown that the "benefits" of that section extend only to those who have not "unreasonably neglected or delayed to enter a disclaimer". We have shown that the paper entered in the Patent Office and called a "disclaimer" is not a disclaimer in fact; that plaintiffs' counsel who filed the disclaimer admit that its purpose was not to limit claims 9, 10 and 11 to the use of a fraction of 1% of oil, but was,by a tricky repetition of words used by the Supreme Court, an attempt to make these claims cover any process in which the desired results are obtained. We have shown that if this purpose was not accomplished the so-called "disclaimer" has not changed the scope of the claims and is not a disclaimer in contemplation of law; and in any case is a nullity.

Such being the facts, no one will say that the plaintiffs have not "unreasonably neglected or delayed to enter a disclaimer." Not only have they failed honorably to conform with the conditions imposed by the statute as precedent to the enjoyment of the "benefits" of Sec. 4922; but they have done worse. They have attempted by shifty practices to expand their patent while pretending to limit it.

Deprived of the "benefits" of Sec. 4922, they have no right to maintain this suit.

CONCLUSION.

It is respectfully submitted that the decree below should be reversed and the case remanded with appropriate instructions.

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